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THE
PEDAGOGICAL SEMINARY

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SOME DATA ON ANATOMICAL AGE AND ITS RELATION TO INTELLIGENCE[1]

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AND
HERBERT WOODROW, PH. D., University of Minnesota

The data here discussed consist of radiographs of the hands and wrists of 402 Minneapolis and St. Paul school children, varying in age from 5½ to 11½ years, inclusive. A record of the number of permanent teeth was also made, except in the case of the children constituting the 10½-year group.[2] Individual intelligence examinations by the Kuhlmann 1917 revision of the Binet tests[3] were given to all the children. The data obtained in this investigation, which is regarded simply as a preliminary survey, permit of the calculation of correlations only in the case of the 7½-year and 10½-year children, because at these ages alone did the children used constitute sufficiently large or sufficiently unselected groups. These two age groups, numbering about one hundred each, were unselected in the sense that each of them included all the children of the particular age in question in some one school building, with the exception of a few children, who, for one reason or another, were absent from school on the days when children were taken to the hospital where the radiographs were made. The children of the remaining age groups, that is, of all except the 7½- and 10½-year groups, were selected on the basis of normality of mental age, fifty at each age, divided equally between the two sexes. These groups of fifty were used, in a manner to be described, to help in estimating the anatomical age of the 7½- and 10½-year groups.

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[1] The writers gratefully acknowledge their indebtedness to the following persons: Mr. Severson, principal in the Minneapolis Public Schools; Miss Taylor, principal in the St. Paul Public Schools; Miss Arthur, formerly of the St. Paul Public Schools, now Psychologist in the public schools of Chisholm, Minn.; and Dr. Holliday of the University of Minnesota College of Dentistry.

[2] Ages were recorded in months. By the 10½-year group is meant all the children of the ages 10 years 0 months to 10 years 11 months, inclusive; similarly, for all the other age groups.

[3] *The Measurement of Mental Development*, a school publication, Faribault, Minn., 1917.

The radiographs were studied in groups, a separate group being made at each age for each sex. The radiographs of each of these age and sex groups were arranged in order from the best developed to the least developed. This ranking, though primarily for the purpose of obtaining the medians of the various groups, was done throughout with all possible care so that it could be used in calculating correlations by the rank-difference method. In this ranking, the surface area of all the carpal bones, as they appeared in the radiograph, was given much weight, but was by no means the sole factor considered; for the shape of the bones, the number of bones, which bones, and their area relative to the total area of the wrist, or their compactness, seemed likewise to be factors of fundamental importance. At this stage of the investigation it seemed best, not to attempt the exceedingly difficult problem of weighting all these factors mathematically, but to make a judgment on the basis of general impression. That such judgments can be made with a high degree of reliability is proved by the almost complete agreement between two rankings of the one hundred 10½-year olds, one of which was made jointly by Mr. Severson and one of the writers,[4] and the other by Professor Richard Scammon of the department of anatomy of the University of Minnesota. The two rankings, it is true, were not, in the technical sense, "independent" rankings, since the second was made simply as a review of the first; but the second ranking was made with all possible care and thoroughness and resulted in an agreement with the first that was complete except in four cases. Of these four, none was changed more than three places, in the ranking from first to one-hundredth.

After the radiographs of each age and sex group had been ranked, the median of each group was chosen and used as a norm. Norms were thus secured for each sex from the ages of 5½ to 11½, inclusive. These norms constitute a scale for the measurement of carpal development, or "carpal age." No one having yet published a scale suitable for such measurements, it was necessary for us to obtain such a scale in order to appraise the carpal age of the children composing our 7½- and 10½-year groups.

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[4] The radiographs of the 10½-year olds were used as a part of the data of an unpublished thesis by Mr. Severson, and have also been discussed elsewhere by one of the writers (Woodrow: "Brightness and Dullness in Children," 1919, p. 115).

Since the highest norm in our scale was that of the 11½-year girls, the scale could not be applied to the measurement of the carpal age of the uppermost portion of the 10½-year group. The carpal age of these advanced children was, however, carefully estimated by a method of exterpolation; that is, by assuming that at and beyond the upper end of our scale, differences in carpal development which appear equally marked to the observer represent equal differences in age. By this method we estimated the carpal age of the most advanced child of the 10½-year group, a girl, to be about that of a normal girl of 12¾ years; and by the same method we graded to one-quarter of a year those radiographs showing a development intermediate between that of this most advanced child and our 11½-year norms. These estimated carpal ages were used simply for the purpose of calculating certain correlations; and since all the children were correctly ranked altogether apart from these estimates, our conclusions would certainly not be materially affected by any possible inaccuracy in the magnitude of the absolute ages we attached to the carpal development of these children composing the uppermost portion of the 10½-year group.

While the scale of anatomical age here used is regarded simply as a tentative one, it may be useful to others for comparison with the present findings. It may be summarized briefly as follows:

BOYS	GIRLS
5½ yrs.: 5 carpals. One of them very small; no ulnar epiphysis. Surface area of bones: 2.9 sq. cms.	7 carpals. Ahead of 6½-yr. boy in that 2 of the 4 small carpals are definitely larger; no ulnar epiphysis. Surface area of bones: 3.4 sq. cms.
6½ yrs.: 7 carpals present, but two of them very small; no ulnar epiphysis. Surface area of bones: 3.1 sq. cms.	Has an ulnar epiphysis extending about ¼ the distance across the end of the ulna; 7 carpals, all fair size. Surface area of bones: 4.6 sq. cms.
7½ yrs.: Slightly behind the girl of 6½ in that he has a smaller ulnar epiphysis (⅙ width of ulna)—but well above 5½-yr. girl in that he has an ulnar epiphysis whereas the latter has none. Surface area of bones: 5.7 sq. cms.	Ahead of 6½-yr. girl in that she has an ulnar epiphysis about ⅗ width of ulna and slightly better development of remaining bones. Surface area of bones: 6.1 sq. cms.
8½ yrs.: About equal to 7½-yr. girl except has larger space	Shows same kind of difference from 7½-yr. girl as the latter

between os magnum and unciform. Has an ulnar epiphysis about ⅗ width of ulna. Surface area of bones: 5.9 sq. cms.	from the 6½-yr. girl; namely, larger ulnar epiphysis and better development of all the other bones including radial epiphysis, and approach towards radial union. Shows a point of contact between ulnar epiphysis and ulna, and good development, with over-lapping, of the trapezium and the trapezoid. Surface area of bones: 7.8 sq. cms.
9½ yrs.: Not much different from 8½-yr. boy, except definitely larger and more oval ulnar epiphysis and less space (little or none) between the os magnum and unciform. Surface area of bones: 6.1 sq. cms.	Large, heavy epiphyses, radial epiphysis touching shaft, with a bare suggestion of an ulnar styloid. Differs from preceding simply in better development of all the bones, but particularly in better development of ulnar epiphysis. Surface area of bones: 9.1 sq. cms.
10½ yrs.: Slightly below 9½-yr. girl but well ahead of 8½-yr. girl in epiphyseal development, particularly of the ulna, and in general development of the carpals. Surface area of bones: 8.9 sq. cms.	Well-developed ulnar styloid and a small pisiform. Surface area of bones: 9.7 sq. cms.
11½ yrs.: Has no styloid or very poor one, and in general is well below 10½-yr. girl, particularly as regards epiphyseal development; bare suggestion of a pisiform. Surface area of bones: 9.6 sq. cms.	Good-sized pisiform, with some progress in ulnar union; high degree of compactness. Surface area of bones: 10.3 sq. cms.

The method of measuring the development of the teeth needs little description. It was very simple, consisting merely in the determination of the number of permanent teeth which had erupted. A tooth was counted only if it had broken through the gum. In the case of the 10½-year group, data on teeth were not obtained.

Before presenting the various correlations which were calculated, we shall briefly indicate the range of distribution in anatomical age of the 7½- and 10½-year groups, and describe the extent of sex differences. Data on these points will serve to emphasize the practical importance of a knowledge of the relationship of anatomical age to intelligence.

The variation in anatomical development of children of the same chronological age is very great. In the 7½-year group, the most advanced child (who, as in all the age groups, was a girl) had an anatomical age about equal to that of the median boy of 11½ years, and the least developed child in the group (who, by way of exception, was also a girl), an anatomical age slightly below that of a median boy of 5½ years. The radiograph of the former showed a well-developed ulnar epiphysis, with a good styloid process and a good development of all the carpal bones except the pisiform, which was still lacking. The hand of the latter had no sign of an ulnar epiphysis and in addition completely lacked three of the carpals—the trapezoid, the trapezium and the scaphoid.

In the 10½-year group, the most advanced, a girl, had a hand well in advance of that of the median 11½-year girl. Our data, as already explained, do not permit us to state with definiteness, in terms of years, development beyond the age of 11½ years, but we estimate the carpal development of our most advanced 10½-year girl to be equal to that of the median girl of 12¾ years (probably about equal to the median boy of 14¾ years). The least-developed wrist in this group, that of a boy, was found to be no better developed than that of the median boy of 7¾ years. Thus, the 7½-year chronological age group covered a range of about 6 years, and the 10½-year group one of about 7 years, of carpal age as measured by boys' norms.

In the 7½-year group, the largest number of permanent teeth possessed by any child was sixteen and the smallest number, one. There was just one child at each of these extremes. For the 10½-year group, as already stated, data on teeth were not obtained.

The importance of such enormous variations as those just cited, in the anatomical age of children of the same chronological age, becomes obvious when it is remembered that our comparisons of children are usually based upon age. Whether a child should be classed as bright or dull, for example, depends upon his mental ability as compared with other children of the same age. Since the variations in anatomical age we have found are those found in groups of only one hundred ordinary school children, it is clear that the substitution of anatomical age for chronological age would radically transform any ranking of the brightness or dullness of the children composing such groups as school classes, or age or grade groups.

Sex differences, according to the present data, were found to be of the same striking degree one should expect from the investigations of Pryor[5] and of Bean.[6] Their extent is indicated briefly in Table I, showing that girls, even at the early age of 5½ years, are 1½ years older anatomically than boys. On account of the large sex differences the distribution of children of the same chronological age in anatomical age, whether measured by the number of teeth or by carpal development, is very definitely bimodal.

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[5] *Bulletins of the State College of Kentucky:* 1905, "Development of the Bones of the Hand," pp. 30; 1906, "Ossification of the Epiphyses of the Hand," pp. 35; 1908, "The Chronology and Order of Ossification of the Bones of the Human Carpus," pp. 24.

[6] "The Eruption of the Teeth as a Physiological Standard for Testing Development," *Ped. Sem.*, vol. XXI, 1914, pp. 596-614.

TABLE I

Sex Differences in Anatomical Age

Number of children in the groups was as follows: 7½ yrs., 40 boys, 62 girls; 10½ yrs., 46 boys, 54 girls; remaining yrs., 25 boys and 25 girls.

Median Carpal Age of Girl	Equivalent Age of Median Boy	Difference
...	5.5	...
...	6.5	...
5.5	7.0	1.5
6.5	8.0	1.5
7.5	8.75	1.25
8.5	10.25	1.75
9.5	11.5	2.0
10.5	....	...
11.5	13.5 (estimated)	2.0 [?]

Average Number of Permanent Teeth

7½-yr. girls, 9.6
7½-yr. boys, 8.2

The existing data on dentition, carpal development and pubescence all indicate that anatomically the girl is at all ages older than the boy. The question might arise whether this indication was not contradicted by the fact that boys are superior to girls in height and weight at all ages except those near the age of puberty. Height, in particular, it might be argued, being practically nothing but another name for skeletal length, should not contradict the findings as regards the development of the wrist bones; and, even if it did so, it might be urged, it would have just the same claim to be used as a measure of anatomical age as has degree of carpal development. The apparent contradiction disappears as soon as we consider the proper meaning of the term anatomical age. Anatomical age means always a stage or a proportion, and not an absolute amount. A child is advanced in anatomical age if he has completed a large proportion of his final anatomical development. In the case of height, we cannot tell whether a child has completed a large proportion of his final development because we do not know what his final height will be. In the case of the carpal bones and of the teeth we are better off, because in these cases we can readily determine what stage the child has reached in a known series of stages. It is true, the child may never complete all the stages—for example, he may never acquire his wisdom teeth; nevertheless, unless all the stages are completed, development is incomplete. On the other hand we cannot say of a given child that his development is incomplete if he does not reach some designated height or weight.

The superior value of a knowledge of stage as compared with simple amount of development is shown in the fact that both carpal development (judged in the manner described above) and the number of permanent teeth correlate definitely higher with intelligence than do simple height or weight. For example, in the case of the group of 10½-year children included in the present study, the correlation between carpal development and the intelligence quotient was found to be 30% for the boys and 40% for the girls, while the correlation with height was found to be only 8% for the boys and only 12% for the girls.

In the case of a large group of children, we may, of course, assume that the final height will not differ greatly from established adult norms. It is possible, therefore, to use height as a measure of anatomical age in the case of very large groups—a possibility of little practical significance, however. But even in the case of large groups it is not absolute height which should be taken as the measure of anatomical age, but the percentage of the final normal height which has been attained.

Now, if we turn to the published norms for height of boys and girls, we find that at all ages the girls have completed a larger proportion of their final height than have the boys. In other words, when height is used in the only way it properly can be used as a measure of anatomical age, it shows the girls at all ages ahead of the boys. For example, according to the data of the English Anthropological Committee,[7] the final height of males is about 67.7 inches and that of females, 63.0 inches. At the age of 7½ the absolute height of girls is given as 44.5 inches, and that of boys as 46.0 inches. Accordingly, the girls of 7½, we may calculate, have completed 70.6% of their final height while the boys have completed only 68.1% of theirs. The difference between 70.6% and 68.1% may not seem great, but it is well over an additional year before the percentage completed by the boys equals 70.6%. At 8½ they have completed only 70.0%. At the age of 7½ years, then, girls are over a year of boy's height ahead of the boys! Similar calculations may be made for the other ages. Thus we find that 10½-year girls have completed 81.1% of their final growth, while boys two years older, those of the 12½-year group, have completed scarcely more than the same percentage, namely, 81.4%. One could hardly expect more perfect agreement with the data on sex differences in carpal development.

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[7] "Report of the Anthropometric Committee of the British Association for the Advancement of Science," p. 294.

The fact that girls at all ages excel boys of the same age in the proportion of their final height and weight which they have attained has not hitherto been emphasized. It appears to be fully as significant as the fact that boys are superior to girls in absolute height. At any rate, it does away with the apparent contradiction between data on height and the fact that the anatomical age of girls is at all chronological ages superior to that of boys.

The chief object of the present investigation is the determination of the correlation between anatomical age and mental ability as measured by means of the individual intelligence tests. Since, however, the school grade attained by children of the same chronological age reflects their mental ability to a considerable degree, it is interesting to observe to what extent school grade is affected by anatomical age. The relations found are shown, for both the 7½- and the 10½-year groups, in Table II. In this table all carpal ages are given in terms of the measuring scale made by the boys' norms—that is, in terms of the carpal age of boys. Should the reader desire to transform the carpal ages given for the girls into the carpal ages that would be obtained by using the girls' norms as a standard, he may do so without serious inaccuracy by subtracting two years from the carpal ages given in Part A, and 1.3 years from those given in Part C. For example, the average carpal age of 10½-year girls in the fifth grade is given in Part A as 12.8 years of boys' carpal age. The average carpal age of this group in terms of girls' carpal age is 10.8 years.

TABLE II

ANATOMICAL AGE AND SCHOOL GRADE

A. 10½-Yr. Group

School Grade		B4	A4	B5	A5	B6	Av.
Av. carpal age (boys' norms)	Boys	10.8	9.5	10.9	9.0	12.0	10.4
	Girls	12.0	12.2	12.3	12.8	13.3	12.3
	Both	11.5	10.9	11.7	11.5	12.4	....
No. of cases	Boys	8	18	14	2	4	46
	Girls	13	18	17	4	2	54
	Both	21	36	31	6	6	100

B. 7½-Yr. Group

		Modal Grades		
School Grade	Below B2	B2	A2	Above A2
Av. carpal age	7.7	8.1	8.5	8.5
Av. No. teeth	8.1	8.8	9.2	10.6
No. of cases	21	37	27	17

C. 7½-Yr. Group in Detail

School Grade		Kg	B1	A1	B2	A2	B3	A3	A4	Av.
Av. carpal age (boys' norms)	Boys	8.3	8.5	6.3	7.6	7.4	6.4	10.3	...	7.5
	Girls	...	8.0	8.1	8.5	9.3	9.4	9.0	6.7	8.7
	Both	8.3	8.2	7.5	8.1	8.5	8.5	9.7	6.7	...
Av. No. teeth (permanent)	Boys	8.0	10.0	7.6	7.6	8.6	9.3	11.5	...	8.2
	Girls	...	8.7	7.8	9.8	9.6	11.4	9.5	9.0	9.6
	Both	8.0	9.0	7.7	8.8	9.2	10.8	10.5	9.0	...
No. of cases	Boys	1	2	5	16	11	3	2	0	40
	Girls	0	3	10	21	16	7	2	3	62
	Both	1	5	15	37	27	10	4	3	102

In Part A, which deals with the 10½-year group, the girls show a regular, but very small, increase in carpal age with school grade. The boys of this group, however, give no evidence of a relationship between carpal age and school grade, except for the sole fact that the four boys in the highest grade, the B6, average decidedly the highest in carpal age.

Parts B and C of Table II show the situation with respect to the 7½-year children. Part B shows the data tabulated in a way which we regard as misleading, but which enables us to compare our results more easily with those obtained by other investigators. It seems to show a very decided relationship between school grade and both carpal development and the number of permanent teeth. Thus, it enables us to say that the 7½-year children who are in the grades above the modal grades, *i.e.*, above the grades in which the largest number of children are found, average eight-tenths of a year of boys' carpal age above those who are below the modal grades. It indicates further that the children above the modal grades possess on the average 1.6 teeth more than those in the modal grades and 2.5 teeth more than those below the modal grades. Our findings are thus in harmony with those of Bean, who sums up his results in the statement that children above the modal grades have an average of eight-tenths of a tooth more than those who are in the modal grade, while the latter have nine-tenths of a tooth more than those who are below the modal grade.[8]

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[8] *Ped. Sem.*, vol. XXI, 1914, p. 613.

The relation between school grade and anatomical age, shown so definitely in Part B of Table II, seems to melt away when the same data are tabulated more in detail, as they are in Part C. Here the data on the 7½-year group are presented separately for each sex and each school grade. As a result, there appears to be no definite relation between anatomical age and school grade, except for the fact that among those children so advanced as to be in the third grade there is a group of children decidedly above the average both in number of permanent teeth and in carpal development. However, the three girls in the highest school grade, the A4, average only 6.7 years in anatomical age—lower than the children of any other group! Likewise, they possess on the average only nine permanent teeth—a lower number than that possessed on the average by the girls of any other grade above the A1 grade.

In Table III are presented the coefficients of correlation between intelligence, as measured by the individual intelligence tests, and anatomical age, as measured by either carpal age or the number of permanent teeth, or by both of these taken together. The coefficients were calculated by the product-moments method ($r = \frac{\Sigma\ x\ y}{n.\ \sigma x.\ \sigma y.}$). The probable errors of the coefficients are given in parentheses. For the purpose of calculating the coefficients, the carpal age of all the children was reckoned in terms of the carpal development of boys. The correlations would be practically identical if we had reckoned it, instead, in terms of the carpal development of the girls. The grading as regards the development of the teeth was accomplished, as already explained, by noting the number of permanent teeth erupted. Anatomical age as measured by both carpal age and the number of permanent teeth ("bones and teeth" in the table) was obtained by averaging the deviations of each child from the average of his age and sex group in the two anatomical traits in question, after having first expressed these deviations in terms of the standard deviations of the distribution. Thus, a child who was one times the standard deviation above the average in carpal age, and two times the standard deviation above the average in number of permanent teeth, would be graded as +1.5 in "bones and teeth."

In calculating the correlations with intelligence, it seemed desirable to use the intelligence quotients of the children rather than their mental ages. By so doing, in the present case, one eliminates any correlation due to variation in chronological age within the age groups. It must be remembered that both the 7½-year and the 10½-year groups included children varying in age throughout a range of twelve months. Since, further, both groups showed a small correlation between chronological age and both mental and carpal age, correlation between the latter two might be due to the fact that the age groups, instead of being strictly homogeneous as regards age, varied throughout this range of twelve months. Since, however, the I. Q. measures intelligence independently, or in abstraction from, chronological age, we eliminate the influence of chronological age entirely by using the I. Q. in place of the mental age.

TABLE III

A. Correlations between I. Q. and Anatomical Age

Probable errors in parentheses

Age and Sex Group	7½-Yr. Girls	7½-Yr. Boys	10½-Yr. Girls	10½-Yr. Boys
r, carpal age with I. Q.	.23 (.09)	.15 (.10)	.41 (.07)	.30 (.10)
r, teeth with I. Q.	.12 (.09)	.21 (.09)	....	....
r, bones and teeth with I. Q.	.22 (.09)	.29 (.09)	....	....

B. Correlations between Carpal Age and Number of Permanent Teeth

7½-yr. girls, r = + .20 (.09)
7½-yr. boys, r = — .03 (.10)

The coefficients of correlation finally obtained speak for themselves. To the writers they seem small—disappointingly so. Only one of the eight coefficients given in the table is over four times its probable error. On the other hand, the coefficients are without exception positive. While the data are hardly extensive enough to make any very reliable comparison between the two age groups, it is noteworthy that the two correlations obtained with the 10½-year group (between carpal age and I. Q.) are both larger than any obtained with the 7½-year group.

Extremely interesting and somewhat surprising are the low correlations found between carpal age and the number of permanent teeth in the 7½-year group. In the case of the boys, the correlation was, in fact, found to be slightly negative. Yet Table III shows that with 7½-year boys the correlation between number of teeth and intelligence is higher than that between carpal age and intelligence. In the case of the girls, the correlation obtained with teeth was not as high as that with carpal development; but taking the results for both sexes into consideration, there is little difference between the carpal bones and the teeth as regards the correlations shown with intelligence. In short, Table III indicates that if we judge the value of a measure of anatomical age by the criterion of correlation with intelligence, the number of permanent teeth is just as good an indicator of anatomical age as is the degree of carpal development. Now, clearly, if the teeth and the carpus are equally good indicators of anatomical age, and if yet these two show only a very poor correlation with each other, a really adequate measure of anatomical age should be based upon both factors taken together. This conclusion is substantiated by the fact that, considering the results for both sexes, our correlations are definitely the highest when we use an amalgamation of the carpal and dental development as the measure of anatomical age. But again, even at best, they are low—at least from the point of view of practical usefulness.

The very low correlation obtained between the carpal development and the number of permanent teeth in the 7½-year group seemed an important enough matter to justify our seeking subsidiary data from the remaining age groups. The remaining age groups consisted of only twenty-five cases of each sex, and consequently the correlations obtained with them are not very reliable. They could not be used at all for the purpose of calculating correlations with intelligence, for they were selected on the basis of normality of intelligence. It is not apparent, however, that this manner of selection would greatly affect the correlation between number of teeth and carpal development, it being the general rule that a group chosen for the study of the correlation between any two factors should be as homogeneous as possible as regards all other factors. In calculating the correlations in the case of these groups the rank-difference method was used. As already stated, the roentgenographs of each group were in the first instance ranked from best to worst. The correlations obtained are presented in Table IV, in the column headed Q.

TABLE IV

CORRELATIONS BY THE RANK-DIFFERENCE METHOD BETWEEN CARPAL DEVELOPMENT AND NUMBER OF PERMANENT TEETH

Age Group	Q
6½-yr. girls	+ .30
6½-yr. boys	+ .20
7½-yr. girls	+ .23 (r = + .20)
7½-yr. boys	+ .03 (r = — .03)
8½-yr. girls	+ .02
8½-yr. boys	— .06
9½-yr. girls	+ .24
9½-yr. boys	+ .59
11½-yr. girls	+ .30
11½-yr. boys	+ .39

Table IV would indicate that, while the negative correlation between carpal age and the number of permanent teeth shown in Table III for 7½-year boys may be rather exceptional, the correlations do tend to run low, so that one might expect ordinarily a correlation not much higher than somewhere along .20 or .30. And Table IV shows one additional instance of a negative correlation, that of the 8-year boys. The general indication then is that, though the correlation between carpal age and number of permanent teeth is as a rule definitely positive, it is low, and may occasionally turn out negative. Table IV would also indicate that at about the age of 8½ years the correlations are apt to be lower than at any of the other ages from 6½ years to 11½ years, inclusive.

As possibly explaining the low correlation between the teeth and the carpus it may be of interest to quote the conclusions of Bean: "There are one or more periods of acceleration alternating with periods of retardation in the development of any one of the structures of the body. The periods of acceleration in the development of one structure may be synchronous with the periods of retardation in the development of another structure." After reviewing the facts concerning the development of the extremities and of the teeth, Bean concludes as follows: "The development of the teeth and of the long bones are therefore reciprocal. The periods of acceleration in the development of the one correspond to the periods of retardation in the development of the other."[9] Boas appears to agree with this view, when, in summarizing the growth of children he writes: "The greater the retardation or acceleration in any one particular respect, the greater will be the disharmonies that develop in the body, since not all the other organs will follow the same rate of acceleration and retardation."[10]

Turning to the general purport of the data of the present study, which have now been presented somewhat in detail, what, we may ask, is the significant outcome? It seems well to attempt an answer to this question, even though we should insist that our data are too limited to settle anything with finality. We will content ourselves with the statement that the indications are that anatomical age is not so closely related to intelligence that our methods of estimating the brightness or dullness of children need be radically modified. We believe that Dr. Ward Crampton exaggerates somewhat when he postulates, that "Physiological age should be taken as a basis for all record and investigation, and pedagogical, social or other treatment with children."[11] As one of the writers has elsewhere stated, physiological or anatomical age should not be substituted for chronological age. If we wish exactness, we may make a correction by adding or subtracting from the chronological age a small fraction of the deviation therefrom of the anatomical age. At the age of 10, this fraction might be as high as one-third; but the present data indicate that at lower ages the fraction should be smaller. Nor do our data permit us to follow Dr. Rotch,[12] when he goes so far as to publish a table showing the proper school grade for each anatomical stage as determined by the development of the carpal bones!

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[9] "The Eruption of the Teeth as a Physiological Standard for Testing Development." *Ped. Sem.*, vol. XXI, 1914, pp. 610-611.

[10] "The Growth of Children," *Science*, vol. XXXVI, 1912, p. 817.

While we are inclined to take a conservative view of the practical applications of a knowledge of anatomical age along pedagogical and psychological lines, we would emphasize that the correlation coefficients we have found between anatomical age and intelligence, small as they are from the standpoint of practical usefulness, are still much greater than those we found between height and intelligence. In this connection it should perhaps be added that the correlation between height and anatomical age is not great enough to justify the hope that the former may be used in place of the latter. In the 10½-year group we found between carpal age and height a coefficient (r) of only .14 for girls and .27 for boys.

SUMMARY

The chief points of interest shown by the data above described may be summarized as follows:

1. The changes in carpal development with age were found sufficiently pronounced to permit the formation of a scale for measuring the same, and such a scale was tentatively formulated for each sex, from the years 5½ to 11½, inclusive.

2. The variation in anatomical development of children of the same chronological age was found to be very great: the number of permanent teeth in the 7½-year group varied from one to sixteen; carpal development, expressed in terms of boys' carpal age, varied, for the 7½-year group, over a range of about 6 years, and for the 10½-year group, over a range of about 7 years.

3. In the case of both the 7½-year and 10½-year groups, the girls were found definitely more advanced anatomically

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[11] "Anatomical and Physiological Age Versus Chronological Age." *Ped. Sem.*, vol. XV, 1908, p. 230.

[12] "Roentgen Ray Methods Applied to the Grading of Early Life." *American Physical Education Review*, vol. XV, 1910, p. 406.

than the boys. The 7½-year girls possessed on the average 1.4 permanent teeth more than the 7½-year boys, and, in carpal development, were as far along as boys of 8¾ years. The 10½-year girls were found to be well ahead of the 11½-year boys in carpal development, and were estimated to be as far along as 12½-year boys.

4. The superiority of girls over boys in the number of permanent teeth and in "carpal age" was shown to be paralleled by a superiority of girls at all ages in growth in height when the latter is measured in terms of the percentage of final height attained at any given age.

5. The correlation between the degree of carpal development and the number of permanent teeth was found to be very low (averaging about +.20).

6. The correlation between intelligence and either carpal development or the number of permanent teeth, while without exception definitely positive, was found to be low, the correlations obtained varying from .12 to .23 in the 7½-year group and from .30 to .41 in the 10½-year group.

7. The number of permanent teeth was found to show very nearly as much correlation with intelligence as the degree of carpal development (considering the results for both sexes).

8. The correlation between intelligence and an amalgamation of both carpal and dental development (in the 7½-year group) was found to be somewhat higher, considering the results for both sexes, than the correlation between intelligence and either carpal or dental development taken alone.

9. The correlation between height and carpal development (in the 10½-year group) was found to be very low (.14 for girls and .27 for boys).

10. A correlation between height and the intelligence quotient was obtained for the 10½-year group for each sex, and in both cases found very much lower even than that between intelligence and carpal development.

11. The relation of carpal development or of the number of permanent teeth to school grade was found to be positive, but very slight and extremely irregular.

PRACTICAL TALKS FOR PARENTS AND TEACHERS

By Mabel Craig Stillman

Preface

The following is not offered to the public as a learned treatise on the subject of sex education, but as an appeal to mothers and fathers to live intimately with their children and to prepare for the questions about life that, in an intimate and sympathetic companionship, will come from the children as naturally as light comes from the sun.

The illustrations given are taken strictly from life incidents in country, town and city. The experience of field work is often more illuminating than theory or book knowledge. The book of life is always open, which all may read who will. It has been a pleasant experience of the writer to find that mothers, unlearned in theories of education, confirm the accepted ideas about the characteristics of childhood and youth, and that more mothers are eager to be shown the way to instruct their children than we have estimated.

Young women, from school, office and factory, have given encouragement because they appreciate the plain explanation of matters vital to themselves.

Wise and good men have added inspiration and strength because they declare that men can live by the same standard of morality as women.

Life

The greatest creation in the world is a human life. The choice and power to reproduce that life is the supreme endowment of mankind.

To promote and direct life is the greatest work in the world.

The rosebud possesses a potential power of development—petal by petal—from within.

A statue of marble expresses the genius of the artist but has no vital force of growth.

The child possesses the possibilities of both rose and marble, unfolding from within and yielding to education from without.

Thus in the development of a human life for the habitation and culture of the soul, father, mother and teacher form a triangle. Human life may be aided by a knowledge of its several periods of infancy, childhood, youth and the adult stage. We must adapt ourselves and our teaching to the various and changing characteristics of each period, and we are concerned in this study chiefly with the first three periods, Infancy, Childhood and Youth.

Babyhood and the Pre-School Age

"He came out from the shores of the Great Unknown, blind and wailing and alone into the light of day." Or as Edmund Vance Cook humorously puts it:

> "He came ungarbed, unbooted and ungloved,
> Beggared and blameless
> Naked and shameless
> And for all he can say even nameless;
> Yet all the world bows down
> To this young mendicant
> As if he wore a crown."

If this child comes as the result of a consecrated marriage, he commences with a life vantage. To be well born is the greatest of gifts from an intelligent parenthood.

The right of the future child to be well born is a primary, inherent power of parents to bestow. Herbert Spencer defines a good individual as one being fit to become a good parent. But, at present, it is the exception, rather than the rule, that careful thought is given the initiation of a child life. The attitude of mind towards the new life in many homes seems to be: "Well, here you are. We didn't want you and we can't afford you, but you belong to us. You're a pretty baby and we'll take good care of you."

The mite of humanity is then treated like a big doll with no feelings; bounced and tickled, loaded with clothes, starved or stuffed according to whether he cries or sleeps; put on exhibition before admiring friends and relatives who poke him in the ribs, kiss and toss him, chuck him under the chin and scream in his ears. Is it any wonder he has the colic? Who would not?

Spare the little one. Let him have quiet sleep, food at regular intervals, freedom from too much or too tight clothing, fresh air, and respect from the visitors.

The foundation for a healthy, normal childhood is laid in infancy, and the young woman who enters marriage without preparation for the care of the baby is responsible for much infant mortality.

Rightly observed, marriage means parenthood, and the young man and young woman should not enter into a contract which involves the coming of children and the foundation of a family without studying the first principles of generation. Yet how many enter blindly into a contract of marriage without having given thought or preparation for the most solemn and responsible duties involved in the coming of a child.

We face the fact that in the greatest of all human events there is lamentable and disastrous ignorance which results in the most distressing consequences known to humanity.

The fault, of course, lies in the neglect of the parents of the past generation to instruct their children on the subject. Considered apart from the absurd and hypocritical affectation that ignorance on this subject is innocence, it appears as the most iniquitous of all forms of neglected education that our youths of both sexes are allowed to grow up in ignorance of the most simple and primary fact of their own beings.

The home is the first school of the child, and the opportunities, therefore, of the parents are unlimited in this question-asking period. The boy or girl is an interrogation point and will doubtless ask about the moon, the sun, the stars, the earth and how everything is made. Fortunate is the child whose questions are treated seriously and answered intelligently. Such a child will learn to ask sensible questions because he knows they are treated with respect.

The parents who grasp these golden opportunities are establishing subjects interesting to the child.

One of these subjects of interest to the average child is the origin of life.

Mothers, you must not fear that the mind of your child has been unduly awakened if, as early as five or six years of age, he asks the question, "Where did I come from?" On the contrary, you may have reason to think the mind of your child has been robbed of perfect frankness if this, or a similar question, does not come to you.

A mother related to me how she gave the first lesson to Tom, aged eight, and to Nellie, six. Tom said, "Mama, why is Tabbie cat growing so large?"

Mother reflected. It was not common in her circle for mothers to tell the truth to their children on this matter; but there had been experiences in her life which had caused a feeling of resentment that preparation for dawning womanhood had not been given her by her mother, and illness had been the result. She decided, therefore, that the present moment should be the beginning of all truth to her children.

She decided, too, that Nellie should hear the story—because she was Tom's playmate, so she answered:

"There are little kittens growing in the body of Tabbie in a soft warm nest, and that is why she is growing so large. When they can take care of themselves, there will be a way for them to come into the world."

"Is that what being born means?" asked Tom.

"Yes, that is what it means. Tabbie must be fed and given the very best of care in the world. We must give her milk to drink and treat her very kindly because she has to give food to the little kittens, just as every mother does to her babe before it is born. We will make a soft bed for Tabbie in a basket and put it in the woodshed, and maybe in a few days we will find five or six pretty kittens there."

"Oh, Mama," exclaimed Tom, "won't that be great! Were we born, too? Please tell us about us."

"Yes, I will tell you, because only mothers must talk to little sons and daughters about this. Every mother wishes to tell her own child, and you must not talk to any of your playmates about it, but come to mama when you want to ask any questions."

She drew them close to her in her room, where they had come with their eager questions, and, speaking in a low voice, she said:

"You grew in a soft warm nest right near my heart. You were there for nine months. I ate food for you and made little clothes for you and prayed for you and loved you before I ever saw you. Then, when it was time, you were born, and mama held you close in her arms and thanked God for you."

The children stood spell-bound, and then with one impulse four arms were thrown around her while Tom spoke for both.

"Now we know why we love you so, Mama."

Right then and there a halo of divine motherhood shone around her head, and the eyes of the children saw it.

Tabbie proved to be the best kind of an object lesson, and this wise mother took advantage of the opportunity and really only answered the child's questions. Animals are dear to children, and the domestic pet is so close as to seem almost human; and caring for the pet mother understandingly tends to increase the love for the human mother.

The stronger the inculcation of this sentiment in childhood, the greater will be the respect for motherhood and fatherhood in later life, with an exalted idea of home and marriage.

The mother who told me this story forged a chain of confidence between herself and children that will bind them to her; and the same wisdom that prompted her then will continue to prompt her to watch for other opportunities later on until the whole story of life is unfolded, step by step.

Another mother's experience: The saying of the Jesuits, "Give me a child until he is seven years of age and I care not who teaches him thereafter," might have been the motto of the mother who gave the following story, which I give in her own words:

"When I was a child I was told everything under the shining sun that was absolutely impossible and positively untruthful, simply from a standpoint of modesty and from the prevailing thought that a child could not understand the serious things of life. I became distrustful of what grown-ups said; but I would believe a child because a child had more of my grade of intelligence. Thus parents insult the intelligence of their children in failing to give them truth and confidence.

"When, after marriage, our babies came to us—a boy and a girl—I decided to answer their questions truthfully and to treat their desire for knowledge with respect. So, as they began to talk, I answered their baby questions about this and that as carefully as I would have those of my most honored guests, and I was rewarded by an unfailing confidence.

"During the kindergarten age the questions were asked as a result of observation. 'What makes Kitty so fat?' 'Why does the rooster fight the hens?' These questions made me realize that I must prepare to answer truthfully the questions in the child's mind.

"With the aid of books and after giving the subject much thought I became convinced that the home is the foundation of human society, and that at home the child should be prepared to take its proper place in the world. A great injustice is done by parents who fail to prepare the child to combat moral degeneracy, which, under different phases, I find the children in a large city have to encounter even in the third and fourth grades. Without the confidence gained from my children I would have been unaware of the real conditions, which may not be common in any school, but which are possible at times, whether in the city or country, in the private or the public school.

"The subject of race continuance should be an education rather than a sudden revelation, and this education may begin as early as the child begins to realize the existence of the great world in which things have their beginnings and growth.

"These lessons should be graded according to the different periods of life, beginning with reproduction in plant and animal life—leaving the human life to be revealed after the mind, trained by the previous lessons, can comprehend the magnificence of a perfect human being. This education should be completed at the beginning of the adolescent age.

"I began to enlarge the kindergarten lessons of family life as always consisting of mother, father, sister and brother. Birds, rabbits, pigeons, flowers, plants, seeds and eggs were studied with the same idea, and my boy of six and girl of five were delighted with everything alive. I taught them about the planted seeds getting their food from the earth and beginning to grow. How the chick hatches from the egg. How the little animals are born. I was careful in these lessons to make them understand that father and mother are necessary, without exciting interest as to the function required of each, expecting to teach this later when the question came. Some children ask immediately, but mine did not.

"With the education already received, it was a beautiful revelation when I told them, at seven and eight years of age, that they were going to have a little brother or sister. Henry wanted a brother, and Nellie wanted a sister. I told them from the first that many mothers did not tell their children and did not want any one else to tell them, and that some mothers wanted their children to believe the stork-and-doctor story. But every mother ought to have the privilege of telling her children as she wishes, so that they were not to talk to others about it. There were never any embarrassing remarks made before others by my children.

"This knowledge had a different effect on the boy and girl. Henry watched my steps carefully, so that I would not fall—asking few questions but always acting the gallant comrade. I remember him pushing things out of my way for fear mother would fall, and taking my arm on going upstairs.

"He heard a conversation about a premature baby dying, and I explained that perhaps the mother had fallen or worked too hard. He came home from school one day and said, 'Mother, who cleaned out the storeroom?' And when I said, 'I did,' he said, 'Mother, you should not work so hard or our baby will die.'

"On Thanksgiving, we have a habit of thanking God for our blessings during the year; and when Henry began his prayer he prayed, 'Dear Father, we thank you for our baby, and, Father, make him a strong little boy, not a sickly little boy as I was.' (The baby already existed to the children—though they had not seen, they had felt his jumps of joy.)

"One night, Henry came to me and asked if our baby might not come that night. I said, 'Perhaps, I do not know just when he will be strong enough to breathe and take his own nourishment.'

"The children both loved to help me and save me work. One day I was cross, and sister said to brother: 'Mother doesn't feel well; that is why she is cross. She won't be cross after baby comes.'

"Nellie took great interest in the preparations for baby—sewed on buttons, fell into raptures over little scraps of lace and went over the bureau drawers every day, straightening them up, and laid out a complete first outfit, talking to him, calling him by name and giving him paddlings for imaginary naughtiness. We were all in Heaven near the date of his coming. The children went to the basket every morning to see if he had come and scolded him because he was so slow in coming. Yet no one among their playmates or in the homes where they went knew anything of these confidences.

"When no company was present we—mother, father, sister and brother—talked freely of our expected gift. I really think this did more to unite us in close sympathy than any experience of an ordinary nature could have done. To gain the confidence of my children on these intimate and vital matters was one of the most sacred privileges of my existence."

Such experiences of these two mothers are given as typical of many others I know who are in the advanced class, realizing as they do the importance of educating the little ones incidently, yet scientifically, in the truths of life because they know that the first period of childhood, or up to the age of seven, broadly speaking, is the foundation of principles of health of body and mind.

There is another truth the child should learn during this period, viz., "What is the difference between little boys and girls, Mama?"

The question will be asked of you, mothers, or it will be taught your child in a vulgar way. This is the way a friend of mine taught her children. I saw the lesson and will describe it to you.

It is time for Billy-Ned, seven months old, to go to bed. The large living room is brightly lighted, and the other children, Charles, Bert, Mary and Danny, are in the room, the older ones playing a game of cards, the younger ones playing leap-frog. Mother undresses Billy-Ned, and when his clothes are off he begins a dance of glee in his mother's lap, a dance of freedom and apparent pride. The children gather around in an admiring group, and the father comes in. He lifts Billy proudly to his shoulder.

We would like to hold the dimpled cherub, but we are too much impressed with the atmosphere of sacredness in this scene to move. He is as beautiful as the alabaster image of the Christ Child.

These lessons have been going on with each new baby, whether a boy or girl, and at times the mother talks to the children about baby's body and its functions, not omitting the organs of reproduction but limiting these talks to the needs of the youngest.

Bathing children together or allowing a romp after being undressed will bring the same opportunities for incidental lessons. The children are not at all conscious of your intentions and think of no shame in connection with any part of the body.

I am sure teachers will agree that this is a most necessary preparation for school.

Teach your child to bathe all parts of the body, and by assuming the rôle of a teacher of physiology and being able to give accurate and interesting information about the eye, the ear, the throat, the lungs, the stomach and, finally, the genital organs, you can impress upon your child the supreme lesson of chastity—in other words, a deep respect, if not veneration, for the body. The very small child cannot comprehend the idea of its being a temple, but he can be filled with wonder and admiration for it if rightly instructed. Read Dr. Albert Moll's "Sex Life of the Child," and you will be impressed, as never before, with the importance of this fundamental training; or talk with teachers of the kindergarten and the grade schools, those who will talk freely, and you will be convinced of the need of this preventive care.

It would be a good idea to give accurate information as to how the eye and the ear are connected with the brain. Secure an illustration from some book intended for the home, more interesting than a text-book, that will show that we hear with the brain, we see with the brain, and it will then be easy to connect all functions of the body with the brain without illustrations. Finally, compare the genital organs with the eye and the ear in regard to delicacy and to the connection with the brain through the wonderful nervous system.

It is easy for the child to understand that the eye, the mouth and the nose have a delicate mucous lining that will suffer with harsh treatment, and it is only a natural step to explain that the genital organs also have the same kind of a lining and therefore must have careful treatment. Teach these principles also by the law of suggestion. Use the finest kind of soap and an extra wash cloth for the face and another just as fine for the genitals. Say, "You like to have good eyes and you will not rub the inside of them when you wash your face, neither will you handle roughly or touch this other sensitive part of your body at any time."

It may seem that I am overstressing these points, but through my acquaintance with teachers of all grades I have found the great prevalence of masturbation in the schools.

Secret practice often begins very early. This habit is observed by the kindergarten teachers as well as by the teachers of the high school.

If the preparation for school here advised is given, together with attention to the proper foods, sleep, play and to the general wholesome surroundings, there will be no trouble of this kind in a normal child. However, it is wise to be open-eyed but quiet in watchfulness of your children. If a child is very nervous and irritable after being in bed or alone, or if he is always nervous and fretful, you may find it is due to this habit. If circumcision is needed in the boy, or a similar correction in the girl, it should have attention. But, supposing the habit of masturbation has escaped the attention of parents and is observed by a teacher, then why cannot the services of a school nurse or of a physician be called into use as well as for cases of sore throats, decayed teeth and the various ailments of childhood? I have failed to find that any provision is made, though teachers are alarmed over the cases. A woman principal of a trade school told me that she requested the superintendent to give a talk to the boys on the general subject of morality, and he said it was the place of the school doctor; the doctor said it was the place of the parents; the parents could or would not, and so we might say the child was in the center of a vicious circle.

In a city school so common was the habit among the boys, practised at their seats, that the teachers called it "the pocket habit." In another city school the superintendent ordered the pockets of the boys to be sewed up. The teachers are usually reluctant to inform the mothers because of fear of giving offense. A teacher related to me, however, an incident where, by the help of the mother, a boy of twelve was cured in a few weeks.

Quite a different result came about when another teacher, feeling the seriousness of a situation, informed one mother that a boy was trying to teach her boy; she also informed the mother of the offending boy, and both mothers were angry.

"My boy, my little Willie, would not listen to anything like that," said one mother.

"My boy would not think of anything like that," said the other mother.

The teacher might have replied, "Madam, your 'little Willie' is dead, and Bill has been born."

It may seem paradoxical, but I would not talk to the child about this or any bad habit. I would not make a picture on the sensitive brain that may become an impulse hard to resist. It is because of the benefit of early supervision and an understanding of the child's proclivities that I have stressed so much the importance of preventive measures. The positive lessons will act like a tonic of strength and will leave the right picture on the subconscious mind of the child.

Many parents have told of talking, with good results, to the subconscious mind of the child while asleep, and it could do no harm to try the experiment. Whoever wishes to try this goes to the sleeping child and speaks the name aloud, even though it may cause the child to become half awake; then a positive treatment is given something like this: "Nellie Smith, you are free from the habit of biting your finger nails. You no longer have any desire to do this. You are entirely cured."

No good results will follow unless the person giving the mental treatment feels the assurance of the things he says to the child. Whether we speak to the child asleep or awake we should remember the law of suggestion acts with definite good or harm on the plastic mind of the child.

THE SECOND PERIOD OF CHILD-LIFE
OR
PRE-ADOLESCENCE (FROM 7 TO 12)

The New Relation—A Teacher—According to G. Stanley Hall, the normal child of seven or eight, and not earlier, is well equipped for school. The brain has received nearly its full growth. A large part of the language has been acquired. The body is strong, if the child has lived the free life of nature and has received the care indicated in the first chapter. Now he is ready to have training in self-control and will power, to have untrained proclivities directed into channels of industry and usefulness.

It seems to me that the only excuse for an abbreviation of the pre-school life is a home unsuitable for the child. Therefore, in this discussion the school age is placed at not earlier than seven years.

There is no definite and sharply marked division in nature between the periods of early childhood and pre-adolescence or between early and late adolescence, but by a consensus of opinion we may say that early childhood continues until the age of seven or eight and pre-adolescence from seven and eight up to twelve and thirteen.

The Teacher as a Co-worker—The third great interest is being added to the child's life, and now we have the triangle of protection—mother, father and teacher.

The school life reflects the home life just as the mirror reflects the face. Almost as truly, too, does the child reflect the school and the teacher to his mother. Mollie's eyes shine with joy when she comes home and tells of what happened at school.

"We had songs and games and our teacher told us a story."

"Oh, Mama, won't you come to school with me tomorrow and see my pretty teacher?"

"Can't I take her some flowers?"

You re-live your school days as you enter into the pleasures and work, ambitions and disappointments, of each succeeding year.

The friend-teacher is a real co-worker with you because she sees the child from the viewpoint of a different relationship and in a larger circle than the home.

The principal of a school in a large city told me that a Mother's Club in his school had contributed much to discipline because there is now co-operation between mothers and teachers where before there was more or less friction.

This co-operation is not always secured even through a Parent Teacher Association. There are too many gulfs between the homes and schools, into which the child may fall.

There are many splendid mothers, however, who are helping to build bridges. One such is a college-bred woman who has three small children, too young for school. She said:

"I am getting acquainted with the teachers in the school because they will soon be a strong influence in the lives of my children." She has organized a Parent-Teacher Association that holds its meetings in the evening, and she has made it so popular that business and professional men attend.

Do all teachers make welcome the mothers who visit the schools? Or are there teachers who resent this as an interference?

There was an extreme case of a teacher in a small town who would not allow mothers to enter her schoolroom. She was not engaged, of course, a second time; and this brings me to the story of her successor, which I relate as a practical example of what can be accomplished when one has a desire to blaze new paths.

For convenience we will call her Miss C. She went to this town from a distant city to develop a plan she entertained of interesting mothers in sex education. If she had known the town she would have been afraid to try her experiment, and if the town had known her it would have considered her a freak. She exerted herself to be very friendly and cordial to the mothers—which was a pleasant contrast to her predecessor.

She had a talent for elocution, and she recited at church fairs, socials, temperance meetings and what not. She was not a woman who cared for popularity; but now it meant helping the purpose that dominated her soul, so she sought it. She arranged an attractive program for Thanksgiving that drew a good audience of mothers and a few fathers. At the close she made a speech, expressing her strong convictions that mothers and teachers should co-operate in the moral training of children and that the new idea of education called for a more direct teaching of truths usually veiled from children. She was discreet in not using the term "sex education" because she knew the word "sex" might be her undoing.

The suggestion of a parent's association was well received and the organization taken up. Two leading women were elected to important offices and a young mother to another; a committee was appointed to draw up the by-laws, and the time was set for the first meeting. Miss C. asked the School Board for money to buy books for the society and received it. Meetings were held once a month, when discussions on different phases of the mother's teaching and the single standard of morality formed part of the program.

Miss C. bought several good books on purity and sex education, which formed a nucleus for a circulating library that the club afterwards bought. A bright woman connected with the leading newspaper—the only one in town—became interested and wrote lengthy accounts of the meetings and the discussions, so the town took notice. Miss C. did not know until long after the Parent's Club was formed that this little town had the name of being "just terrible" and that no voice had been raised in public against silence and prudery or in denunciation of the double standard of morality. She was assisted by the club to arrange a meeting for "Men Only" (the first ever held in the place) where an earnest and fearless man, Professor Goodrich of Albion College, talked to a large audience.

This actual experience is related to show that a teacher who has the courage of her convictions can do a great deal in specific moral education.

The same woman afterwards carried on a widespread education among the mothers in a large city through the medium of mother's clubs. Courses of lectures were given in the school buildings for six consecutive months under the supervision of the Mothers' Congress.

This course was followed another year for seven months under the supervision of the School Board. Not a dissenting voice was heard, although an element had long existed previously that would have ousted the Superintendent of Schools had sex instruction been allowed to one boy or girl in the school.

Parents and Teachers Co-operate—One of the best suggestive examples of co-operation between parents and teachers is found in a private school in New York City—"The Ethical Culture School." There is a monthly meeting of the mothers of children, with the teacher in each grade leading in the conference.

In addition to this there are councils of all the mothers and teachers, and at the regular teachers' meetings there are representatives from the parents and from the School Board.

A paper called "School and Home" is published monthly by the association of parents and teachers.

Character building in school life is of supreme importance and calls for the greatest wisdom and the utmost co-operation between parents and teachers. Not only the moral virtues of truth, purity and honesty may be inculcated, but habits of deportment, cleanliness and order are established by mutual service or endangered by conflicting authority.

Of course we shall have to leave out of this co-operative scheme many indifferent parents and teachers, as well as the type of teacher who will not encourage mothers to visit the school.

The child presents an interesting study in the period which we are now studying. There is a dispute among students of child nature on the reasons for these characteristics.

G. Stanley Hall says: "The years from eight to twelve constitute a unique period of human life. The acute stage of teething is passing, the brain has acquired nearly its adult size and weight, health is almost at its best, activity is greater and more varied than ever before or than it ever will be again, and there is peculiar endurance, vitality, and resistance to fatigue. The child develops a life of its own outside the home circle, and its natural interests are never so independent of adult influence. Perception is very acute, and there is great tendency to immunity from exposure, danger, accident, as well as to temptation. Reason, true morality, religion, sympathy, love and esthetic enjoyment are very slightly developed."

The Boy Scout movement has taken into consideration the "gang spirit" of the boy and is converting it into useful activities. Instincts of adventure, camping, fishing, hunting and hiking are made to serve a purpose in usefulness and character. A certain gang of boys troubled a corner-grocery man by taking vegetables and destroying everything left out of doors at night. Then a whole week elapsed with no trouble, and the man inquired of the policeman, "What has become of those rascals you had to watch around this corner?" "Well, sir, would you believe it! Some little woman has done more than we could. She's got them to come to a Social Center in the schoolhouse, and if Jim McGarvey isn't teaching the rest of them United States history. You know he was the leader of the gang."

A mother, sometimes unconsciously and peevishly, drives a boy away from home. She says, "Oh, dear, Henry is growing into such a rough, noisy boy." She tells him to go out of doors, and he finds boys who are not only noisy but vicious.

Sister Susie is quiet and ladylike. She likes to look pretty, and mother spends her time making clothes for Susie. All the many trifles a girl likes in her room are given her, and she can take her girl friends there to eat the fudge they have made in the kitchen; but it doesn't matter much how Henry's room is furnished or whether it conforms to a boy's idea of fitness or not. It must be effeminate and nice. Henry's friends make so much noise and bring in so much dirt that they cannot be permitted in the house.

A mother in Buffalo found that her boy in the first year of high school had grown tired of it and was on the point of rebelling against school altogether. She didn't nag or scold; but she talked with Percy until she discovered that he wouldn't hate school so much if he could do something with his hands, so she sought a trades school and sent him there.

She helped him fit up a room on the third floor for himself. They talked over the matter of furnishings, and he was allowed to fit it up as best suited his taste. A bright, light, natural-gas stove, banners, trophies, a good bed, a couch with pillows, a large table for books and study, all contributed to make it cheerful.

He was monarch of all he surveyed and attended to the room himself. It was tidy, too, but distinctly a boy's room. He invited his boy friends there whenever he pleased, and instead of the sullen, discontented boy he changed into a happy one, interested in his school, in his home, and became a source of delight to his mother. It was the awakened mother and the room as much as the changed school that caught and held the boy, I believe.

The Father's Part—The father might understand his boy if he would take time to go into his life and sports, but he is too busy during the day and too much interested in other matters in the evening. So the boy's savage instincts are not converted into civilized ones, at least, in the home because boy and father too seldom meet there.

Can you guide or teach him in the primary matters of his questioning mind if he does not hold your confidence? Of what value will be experience to him of the dangers and wrongs incident to sex life if it is withheld from your son until the poison has entered his soul and his life is wrecked by bodily diseases?

The father who cannot talk from his heart as well as his head about the meaning of sex and its approaching manifestations in the son's life would better delegate the task to the mother. Most fathers do thus delegate it, perhaps for other reasons as well as the one mentioned.

Can you guide or teach him in matters of sex when he is approaching the danger age, if you have lost his confidence? Fathers, can you find time to play a game with Henry, run a race, take a walk to the woods, read a story, help him with a lesson or work in the garden or at the bench with him?

A father in LeRoy, N. Y., said to me: "There is no pleasure in the world equal to that of taking my two boys in the auto and going to the woods or fields to hunt for geological specimens and odd things which we put to use in our curio manufacture." A play and study room where the two small boys held sway was situated on the first floor near the family sitting room.

If your boy doesn't care so much for the strenuous life as other boys, but likes to read, let him be furnished with stirring stories of adventure and heroic deeds that will satisfy the desire for excitement and will inspire him to heroic action when he tries to live the life of the hero.

You cannot impart a knowledge of this to your boy unless he feels you are a real understanding friend and that you are giving him a square deal.

Bad boys are often healthy savages too much thwarted.

Most boys do not care for girls at this age; they do not care for personal appearance but want a fling of freedom.

The natural instincts of the girl at this period are very much like the boy's, though less on the surface, because she is told it is not ladylike to run, jump, climb trees, or talk loud and laugh boisterously.

The men of primitive tribes collected in groups to defend the women, and fought with physical strength while the women were removed from the scenes of combat and fought their battles with their tongues. So we do not see the gang spirit in the girls so much as in boys, but in its place, suppression, vanity, deceit and gossip, perhaps inherited from the primitive woman whose submission to the dictates of her lord resulted in moroseness, cunning and deceit.

If we would change this tendency in the girl, let us give her freedom of thought and action. Why shouldn't a girl be free to romp, climb trees, row, swim, play ball and be a good comrade of her brothers? She will be cultivating health and a directness and candor of thought and character. Just as the little girl will naturally retire from the bedtime romp as she develops, so she will become less of a tomboy when her life touches the shore where the brook and river meet.

The opposite type of girl at eleven or twelve may be one who wants to be a regular young lady. She dresses, if she can, in the extreme of fashion, is conscious of admiration from men, invites a premature love affair to which an unprincipled man may respond.

She is the type, too, who is a menace in the school to younger boys and girls. She will often be found in the fifth or sixth grade when she should be in the seventh or eighth. Poor girl! She hasn't any real mother to teach, quiet and control her. She is the girl who is on the streets at night, at the cheap theater, at the railroad depot, in the ice-cream parlor or at the public dance.

If no wise woman—a teacher or neighbor—takes an interest in her she will sooner or later be found in the Juvenile Court. The following incident shows what can be done to prevent this misfortune.

What One Woman Did—A lovely young woman came to me after a lecture in one of the public schools and told me that she had been recently married and was going to live in the West. She expressed a desire to learn all she could about the subject of teaching children properly and took a very intelligent interest in the "moral education." I was so much impressed with her natural frank and earnest attitude that I made inquiries about her and was told that at one time this girl was one of the toughest in the school, which is situated in a rough part of the city. But a teacher mothered the girl, took her home with her and kept her over night, because she saw the possibilities in the girl. I do not know the teacher, but she probably does not boast of any greatness; yet what could be more Christ-like?

Strange and unbelievable as it may seem, if the teacher in that city had collected a number of girls who needed the help which she gave this wandering one and had talked to them in school as she did to the girl in her home, it would have cost her her position as a teacher.

When and how will the insanity of such management be cured?

Natural History as an Aid—Boys and girls in the second period, or between eight and twelve, love activity and are easily trained in habits of obedience and industry. Mechanical activities, such as drawing and physical training, dancing, acting, spelling and reading, are easily mastered. Many boys and girls take a vital interest in gardening when they are given responsibilities and an interest in the proceeds.

The commercial interest makes its appeal. Spiritual development is gained when children are taught the family life of the blossom (mother), pistil (father), pollen (children) (seed) and learn to watch the changing phases of the roots, the bud, the blossom and the seed.

This is sex education combined with useful work and should be the first lesson. Plants, flowers and window boxes can be used as substitutes in the winter or where a garden is not possible.

The children will be interested in getting caterpillars and feeding them, and watching the development into cocoons and then into butterflies. Hens' eggs, frogs' eggs, crawfish eggs, turtle eggs, are studied in their natural environment and from the standpoint of education in reproduction as well as in a tenderness and a care for the mother and for the young. The lesson of the difference between the fertilized and the unfertilized egg will be another important one in the part the father plays in nature. The observation of nature in the country is by no means sufficient; neither is any undirected observation. Nature study means an insight into the secrets of nature and of the wonderful plan running through all life.

The beauty of reproduction must be given by the wise parent or companion and should be taught in connection with the life habits of animals. In this way it takes its proper rather than a too important place.

The study, observation and care of domestic fowls afford the opportunities for industry and a certain amount of useful knowledge such as the selection of a good mother and a good father, the development of the chick within the egg and the strong mother-love, attributes of the hen; but there are no opportunities to teach family life, because whatever was monogamous in the male has been bred out of him for commercial purposes. The students of breeding have decided that one male is sufficient for a certain number of females, so far as the fertilization of the eggs is concerned, and for this reason one only is allowed for economical reasons.

The birds are the most beautiful examples of family life; and when the children attract birds to the trees and shrubs, build bird houses, set water in basins, scatter crumbs in the winter—in other words, show the children that love means care and protection, and you will be rewarded with the opportunities for pointing out examples of courtship, marriage, building the home, and rearing and caring for the young. The father presents the best kind of a lesson in animal life in devotion and faithfulness to family life. This study of the home and family qualities is enhanced and made more interesting through increasing study of birds in the schools and parks.

Following these lessons, if the teaching is done systematically, will come the care and study of a mammal—a cat, a dog or a rabbit. The rabbit is a better animal, if one is to choose, because the pair can be chosen for good qualities and the matter of selection made prominent as well as a purposeful and a planned parenthood. This is better than wandering, quarreling and howling male cats that are not very romantic or exemplary fathers. Perhaps nothing would be more helpful, right at this point, than to give you, in her own words, an account of how a lesson on the mammal was given in the third grade of the Kalamazoo Normal training school by Miss Bessie Goodrich.

Pet Animals as Subjects for Study—"In our school we have thought it worth while for each grade to keep and care for some pet during the winter months, and last year the third grade adopted a female rabbit. As time went on, the children expressed a wish for some little ones. Together we discussed what must be done, and I left the discussion largely in their own hands because I wanted to discover whether I had to meet any perverted thought. There was none except in the case of one or two of the older boys, where I imagined I saw a suggestion of the wrong attitude. They watched me closely; but when they found that I encouraged the open discussion, they entered into it with a good spirit. It was decided in the most simple fashion that there could be no family of babies without a father, so the male rabbit was brought in. One of the boys had raised rabbits at home, and he instructed us in the proper care of the mother while she was carrying her little ones. Indeed, this little boy, who was most fortunate in his parents, was our instructor all through this period. When questions arose he explained in the most naïve fashion. During the weeks before the birth, the most tender care was taken of the prospective mother. The Friday before Easter we left school knowing the little ones would soon come. The following Monday, when we returned, there were seven babies. It is needless to say that joy was unbounded.

"You ask, would we repeat it? Most assuredly we will. And were there any objections from outside? None, whatever.

Among the principal things learned in these lessons were—the necessity for the male parent, the chief difference between bird and mammal eggs, the reasons why the latter must incubate the eggs within the body, and the care which mammals give the young.

"Besides, and one of the most important points, it gave the right color to the knowledge—a color which will not easily fade from the children's minds.

"Such nature study gives the child something he craves with his whole being, something he is bound to get, too soon or later, generally sooner, for better or worse, usually for worse. If nature study could be taught in this related fashion, instead of in a scrappy, half-hearted way, I think the children would be kept from many a secret session of forbidden talk, led, perhaps, by wrongly informed companions."

The average age, I should say, of children in the third grade is not more than eight or nine years, so with the accomplishment of these things at that age we can easily see how all that is necessary for a youth to know about the human can be learned before the pre-adolescent age of twelve.

There are no definite boundaries, we know, between childhood and youth, and the girl usually shows signs of puberty before the boy, sometimes two years earlier; but the boy's observation and reflections are usually ahead of the girl, so he is ready for instruction as young as the girl. Boys of a scientific, analytical turn of mind demand of the mother much explanation which she would like to postpone.

She has the privilege in this, however, of following where the child leads, and she can broaden and glorify the secrets of reproduction in the very soul of the child.

There come, too, unexpected events that will demand explanation of some phase of life. As an example, a mother asks: "What should I have said when my daughter of eleven came from school and exclaimed, 'Mama, they are talking about —— at school, and they say she has a little baby and that a boy is its papa. Why, Mama, they are not married. It isn't true, is it?' " I asked the mother if she had talked with her daughter at all about parentage, and she replied that she had not; so this was my advice. I would say: "Mary, it may be true, and I will explain more about it after we have had some little talks together. Let me talk with you every night when you go to bed until you understand. I will do this if you promise not to listen to or talk with any one of the girls at school." Many mothers have requested help in similar perplexities. It is an evidence of the mistaken idea that we can keep children "innocent" or, in other words, ignorant of life.

No opportunity occurred in the cases described to present the beautiful interpretation before an abnormal and deplorable vision of life was thrust upon the child.

Children are also seeing problem plays in the moving-picture plays, which arouse a pre-mature interest in love and passion, beyond their judgment to interpret.

It is not for these reasons alone that the education concerning the meaning of sex in human life should be nearly completed in this stage, but for a more important reason—Mother Nature is gradually preparing youth for manhood and womanhood, and on its threshold stand the boy and girl eager for a knowledge which later they will not welcome.

The present stage (or at twelve or thirteen), therefore, is a most opportune time to give as much concerning the meaning of adolescence or of sex in human life as you think necessary for the healthy condition of mind and body after the actual changes have come.

The Young Girl's Problems—Until about this time much of the information has been given incidentally and perhaps in response to questions, but it may now be necessary to thrust certain specific information upon your child. For instance, unless circumstances have arisen to bring the subject of menstruation to the notice of your daughter, you will be obliged to explain it to her in detail; and this will bring to her an added meaning of parenthood.

It will help you to possess a vocabulary of scientific words and a knowledge of the physiology and anatomy of reproduction, so that you can express yourself confidently. This may be obtained from one of the many books written by physicians.

It is deplorable that many mothers neglect to prepare their daughters for the great event in their lives. A mother told me that because of her mistake her daughter came home from school in great agitation and gave way to hysterics that lasted for hours. She shut herself in her room and would not be reconciled. The shock caused a nervous trouble that kept her out of school for two years. A mature woman related to me that she stopped her first menstruation with ice water and had brain fever within twenty-four hours. A careful mother told me that when she gave the specific information to her girl it caused her to weep, but when the change came she was ready and it had no apparent effect on her emotions.

Neglected Boys—There is much negligence of a girl's education at this time, we know, but the boy's preparation for the change that will come to him is still more neglected.

The father's time has come to tell his boy, in the same careful but plain way that the mother has used in telling to her daughter the facts about menstruation, that a change is coming for which he must be prepared. The education due the boy is of far greater importance than is usually realized.

It is to be hoped, however, that the number of fathers are few who are so barbaric as to express themselves in the way that has been described by several mothers: "What can I do? My husband and his mother tell me that when our boy is about fifteen he will have to find a girl or woman for a mistress."

A mother described to me her joy in hearing from a lecturer on sex hygiene that a man could live as pure a life as a woman. She said: "I knew my older boy was not living a good life, and I knew he contracted a venereal disease; but I thought the double standard must exist, but after that lecture my eyes were opened. I have literature, and I am talking with the younger boy. He has heard lectures at the Y. M. C. A., and now I know he is living a chaste life."

Many parents may object to the theory that a boy of twelve or thirteen should have a knowledge of what sex will really mean to him, but in support of the idea I advocate let me quote from M. J. Exner, M. D.

In his report of the results of a questionnaire conducted among 948 college men he says that "63.9 per cent received their first striking impressions of sex before the eleventh year and 87.6 per cent received them before the thirteenth year, that is, before the beginning of puberty. The average age at which the first permanent impressions were received was 9.6 years."

He continues: "The tremendous import of these facts challenges serious attention. We know that it is a law of the mind that first impressions tend to be the most lasting. They are the most difficult to eradicate. It is also to be borne in mind that the sex instinct exerts a more profound influence upon human life than any other instinct and that it is more easily misdirected. The sex instinct furnishes the greatest undercurrents of life, especially during that life-shaping, character-determining period—adolescence. It gives character and direction to life more than any other human instinct.

"It is, therefore, of the utmost importance that the earliest sex impressions shall be of a wholesome nature and proceed from responsible sources."

Is not this sufficient evidence to convert the doubting to a conviction that, in this triangle of mother, father, teacher, one or all three should gain a scientific knowledge to impart to the boy the information necessary to save him from contamination of mind and body?

Is there not evidence, as well, to support the idea that this safeguarding must be given before the adolescent age?

I submit an outline of instruction in sex education which gives only a few hints of the more or less graded work that parents can prepare to do. An outline is bare and blunt, but coming as it does at the end of a discussion of the two periods—pre-school and pre-adolescent ages—in which much has been said about the indirect teaching, that is, about an understanding of child nature as a pre-requisite of sex teaching, it will serve as a ready-to-hand summary for reference.

INSTRUCTION

The instruction supplies certain subject matter and definite methods for parents to use in giving it to the children.

We might say the parents must know something of biology, physiology, anatomy and much of psychology, but in more simple language we might say they must know certain facts about the human body and how the Creator performs the miracle of creation. They must know what the contents of the child's mind will likely be at different ages, so that they will know how to adapt the truth to the child in a way which will be not only a real lesson in the beauty of all things created but will be character building of the highest kind.

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1. (a) The appearance of seeds, easily observed, such as peach, horse-chestnut, hazelnut, apple, orange, peas, beans and corn.

The hard cover protects life within: is, therefore, a house, or nest.

(b) An open hazelnut shows a dwarfed, black seed. Why? The answer will be developed in a study of the blossom.

(c) The Easter lily. The blossom is a house and family. That is: mother (pistil), father (stamens) and children (seeds) are within. The touch of the pollen grain with something in the seed creates life. The quality of life depends upon the mother and father. Eugenics.

Something was wrong in the blossom that produced the bad hazelnut.

(d) Perfect flower on the apple tree produces perfect apple, in connection with the proper nourishment.

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1. (a) Commune with nature and the child. Madam Montessori says, "The child becomes spiritual through nature." Let the child plant peas, beans and corn in a glass with moss and blotting paper and watch them grow.

(b) Take children on nature study expeditions.

(c) Read to the child and tell stories that will influence conduct.

2. Lessons concerning respect for the body by means of the bath.

(a) Talks by the mother as she bathes the child about the eye, and ear, the nose, the mouth, the chest, the hands, the feet and the reproductive organs. No part is evil; all should be clean and sweet but not touched for anything but cleanliness, and for the call of nature. The body is a beautiful house.

(b) Instructions to the mother as to why a physician should examine the lower orifices of the body to ascertain if there are abnormalities or if the boy or girl needs circumcision.

(c) The difference in sex learned by the child as young as possible, *i. e.*, bathing a boy and girl together, by means of a baby or by a romp just before going to bed.

4. Kind treatment for the child who masturbates. Mother will help fight the battle if there is one after the hygiene and circumcision are attended to, and the mind informed.

5. Plenty of out of door exercise for the child up to eight years. According to Stanley Hall, the child should not go to school until eight. Premature control of nerve centers weakens will power in the later period. The trunk, arms, legs should have much exercise. Madam Montessori would train the child's senses through self-directed activity. She says a child is not trained when it is made to be as still as a paralytic or as mute as a stone.

From the Age of Seven to Ten

I. From the seen to the unseen.
    (a) Protoplasm in the hen's egg.
    (b) Cell life { wall, body, nucleus
II. Reproduction asexually.
    (a) Amoeba.
    (b) Molds.
    (c) Slipper Animal.
III. Spyrogyra (union of two cells).
IV. Reproduction sexually.
  1. Fucus.
    (a) Antheridium.
    (b) Oögonium.
  2. Hydra.
    (a) Sperm cell.
    (b) Egg cell or ovum.
  3. Easter lily.
  4. Apple blossom.
  5. Seeds.
    (a) Apple seeds.
    (b) Peach pits.
    (c) Hazelnuts.
    (d) Corn.
    (e) Beans.
    (f) Peas.
  Insects.
  6. (a) Grasshopper.
    (b) Butterfly.
    (c) Bee.
  7. Angleworm.
  8. Fish.
  9. Fowl (dawn of parental love).
  10. Bird life.
    (a) Habits.
    (b) Courtship.
    (c) Home life.
    (d) Care of offspring.

Application

1. (a) Connect the "Story of Life" in the lower forms of plant life with the higher.

(b) Connect the higher forms of plant life with the insect.
(c) Connect the insect life with the frog and fish.
(d) Connect the life of the frog and fish with the fowl and bird.

2. The attention of the child is gained by concrete objects.
(a) Use the flowers, plants and seeds easily obtained.
(b) Get caterpillars and put on a bush with mosquito netting inclosing them.
(c) Watch the caterpillar eat and grow into a chrysalis.
(d) Place chrysalis in a warm room and watch for the butterfly.
(Notice that the male butterfly dies after giving up sperm cells.)
(e) Get frog eggs from a pond in April, put them in water and watch them develop into tadpoles.
(f) Mark some hens' eggs and watch them develop. Take the one marked 2 out the second day, the one marked 5, the fifth day, etc.
(Explain the fertilization of the nucleus of the egg.)

3. Recreational activities.
(a) Working with tools.
(b) Caring for a garden.
(c) Rearing and caring for pets increases gratitude towards parents.
(d) Housework and doing errands.
(e) Habits of industry developed into interest for home.
(f) (Story of Mrs. W.)
(g) Games and picnics at home.

4. The child from seven to ten is easily controlled.
(a) Willing to be taught.
(b) Delights in drill and mechanical duties. Music, gymnastics and drill part of arithmetic.

5. Boys, untrained, are like primitive men.
(a) Delight in roaming and out of door life.
(b) Would like to live in caves or tents.
(c) Gang spirit begins to be manifest.
(d) Has no pride in personal appearance.
(e) Doesn't like girls, teases his sisters and fights with boys.

6. Literature for this age should be strong, stirring stories of heroic adventure. (Examples.)

7. Girls show less marked characteristics than boys.

The girl is fond of out of door life. If natural, she likes some of the same activities as the boy.

Doesn't care much for dress.

Likes to play with girls and boys in any kind of weather.

The overtrained girl prefers to whisper secrets to another girl, sometimes manifests the traits of primitive women in the love of secrecy and sometimes in cunning and deceit.

The free open life is better than too much repression.

The girls and boys at this age should play together in the homes or in the grounds. This will modify the roughness of the boys and bring out frankness and candor of the girls, especially if the group belong to families where the information about sex life has been given and the children feel free to go to the parents with questions. Gardens, chickens or pet animals will give an outlet for energy and will be a splendid opportunity to observe sex life under the direction of mother and father.

From the Age of Ten to Twelve

I. Mammal.
   1. Rabbits.
   2. Kittens.
   3. Puppies.

4. Lambs.
5. Calves.
6. Colts.

II. Difference between other animals and mammals.
  1. Egg is smaller and more precious.
  2. It is fertilized and developed within the body of the mother.
  3. The mother gives the offspring nourishment from her body.
  4. The offspring has long infancy.
  5. The mother requires love and care.
  6. Mother and father may be chosen for parenthood.
  7. Laws of procreation may be observed when fine offspring are desired.

III. Characteristics of mammals.
  1. Nest for eggs is in the ovaries of mother before they are fertilized.
  2. Nest for egg after it is fertilized is uterus.
  3. The spermatozoa of the father joining with the egg in the mother make the embryo.
  4. Spermatozoa must be healthy. Nest for the spermatozoa is called scrotum or testes.
  5. Unfertilized eggs pass out of the passage from uterus at regular intervals.
  6. The eggs do not leave the ovaries when the embryo is growing in the uterus of the mother.
  7. Different kinds of mammals.
  8. Different homes of mammals.
  9. Different names of male and female.

Buy a pair of rabbits and choose for good parenthood. (Kalamazoo teacher.) Father is an interested companion and hero in the eyes of the children. He tells stories, sleeps in a tent with the boys, goes hiking, works at the bench, and plays games of chance, enlists the services of the children in the work of the home. Mothers and fathers visit and visit and visit with the children.

The wise parent can easily weave into the last lesson the specific discussion in the pages just preceding this outline.

The information will be more welcome to the boy and girl of twelve and thirteen or older if made impersonal.

The remaining lessons may seem formidable and too much to teach to children of twelve and fourteen. It is too much to be taught in a short period, but we are considering that it is only the culmination of twelve years of teaching and that much has been given all the way.

The color always must be remembered. Not knowledge alone will give wisdom.

ADOLESCENCE, OR THE NEW BIRTH, FROM THE AGE OF TWELVE TO FOURTEEN. MENTAL CHANGE. A NEW WORLD OPENS

1. Begins to reason on new lines.
   Mystery of life?
   Who am I?
   Who is God?
   What is everything?
2. Mutual attraction between boy and girl.
3. Much regard for personal appearance.
4. Self-willed, egotistical, important.
5. Voracious readers—girls, romance; boys, adventure.

6. Fond of the romance in drama and moving pictures.
7. Form new and sometimes peculiar friendships.
8. Parents often slighted.
9. Serious love affairs.
10. Peculiar taste in eating.
11. Often despondent and ill-tempered.
12. Gay and reckless and restless.

This Age Needs Wise Guidance

Parents must relax discipline, and govern by invisible leading strings.

1. Permit the young people to be grown up.
2. Let them assert themselves.
3. Sympathize with every new or peculiar turn of their minds.
4. Do not mollycoddle.
5. They are becoming individuals.
6. Treat their opinions with respect.
7. Provide opportunities for harmless amusements where boys and girls can mingle.
8. Give them ideals to contemplate.
9. Encourage great ambitions.
10. Provide healthful activities—wholesome and pleasant for the girls; strenuous and exhausting for the boys.
11. Mother often influences boy more than the girl.
12. Father influences girl more than boy.

Physical changes herald the approaching adolescence.

1. Rapid increase in height (often 1 inch per month).
2. Widening of shoulders and hips.
3. Increased blood supply and pressure.
4. Change in features.
5. Hair becomes lustrous and thick.
6. Girls develop grace, roundness and beauty.
7. Boys develop awkwardness, leanness, whiskers and a deep voice.

The cause is the changeless one of nature.

The power of reproduction is developing within the testes of the boy, and the same power is developing within the ovaries of the girl.

These changes come two years earlier to the girl than to the boy.

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1. Review.
2. The "Story of Life" now reaches the highest form, or Human Life.
3. Comparison of framework of orang-outang and human.
    (a) Skeletons similar excepting heads.
    (b) The mouth of orang-outang projects and the forehead recedes.
    (c) The mouth of the human recedes and the forehead projects.
4. Brain of man is the commander.
    (a) Anatomy.
    (b) Function.
5. Nervous system.
    (a) Cerebrospinal.
    (b) Sympathetic.
    (c) Vaso-motor.
6. Anatomy of body.
    (a) Essentials of the framework.
        1. Spine.
        2. Ribs.
        3. Pelvis.
        4. Hip bones.

7. Situation of the vital organs.
8. Physiology.
    - (a) Function of the lungs.
    - (b) Function of the diaphragm.
    - (c) Function of the digestive tract.
    - (d) Function of the skin.
9. The function of the pelvic organs in woman.
    - (a) Uterus.
    - (b) Ovaries.
    - (c) Fallopian tubes.
    - (d) Vagina.
    - (e) Vulva.
10. Function of the pelvic organs in man.
    - (a) Scrotum.
    - (b) Penis.
    - (c) Vas deferens tubes.
    - (d) Seminal vesicles.
    - (e) Prostate gland.
    - (f) Cowper's gland.
    - (g) Urethra.
11. The internal secretions and their effect in puberty.
    - (a) From the ovaries.
    - (b) From the testes.
12. Menstruation in woman—signs of approach.
13. Periodicity in man—manifestation.
14. Health of mind and body.
    - (a) Air and sunshine.
    - (b) Cultivation of the diaphragm.
    - (c) Food.
    - (d) Relaxation.
    - (e) The law of suggestion.

Post-Adolescence—From the Age of Fourteen to Twenty-One

I. Development from girlhood into womanhood.

1. The meaning of true womanhood:

(a) Perfect health of mind and body.

(b) The ability to know herself.

(c) A knowledge of the physical functions of reproduction in both male and female.

(d) Knowledge of woman's influence over man's weakness, and a conscience in the use of it.

(e) Knowledge of the social diseases.

(f) Knowledge of the higher laws of procreation and of eugenics.

(g) Habits of industry and usefulness.

(h) Knowledge of home-keeping and child care.

(i) Activity in the home of humanity or the world.

II. Development of boyhood into manhood.

1. The meaning of true manhood.

(a) Perfect health of mind and body.

(b) Training in self-control.

    1. Through normal health.
    2. Through temperance.
    3. Through ideals.
    4. Through chivalry.
    5. Through physical training.

(c) Scientific knowledge of reproduction in both male and female.

(d) High ideals of brotherhood and fatherhood.
(e) A knowledge of the social diseases.
(f) Ability to deny the "Physical Necessity Lie."
(g) Knowledge of the laws of procreation and eugenics.
(g) Habits of industry and business.
(i) Altruistic activities.
(j) Courage, honesty, truthfulness, purity.

However, through the teaching of these lessons or of others substituted by initiative and through circumstances occurring in daily life, one must remember the job is never completed.

A mother once said to me, "I told my boys one day under the shade tree."

I suppose she told them some important facts, but just as she has to prepare food daily for the ever recurring appetite, so will she have to give them counsel, companionship and supervision to meet their ever recurring appetite for knowledge not learned from books. It is no task, but a God-given privilege.

FINALE

Is it too much to expect that the child, protected, guided and instructed within the loving triangle of mother, father and teacher, will grow into the full stature of a human being—a being who will give out to humanity Love, Power, Joy, Inspiration, Health and Wisdom? And finally that there shall appear upon the earth the superman?

"The rise of man is endless
Be in hope
All the stars are gathered in his horoscope.
The brute man of the planet he will pass
Blown out like forms of vapor on the glass
And from this quaking pulp of life
Will rise the superman
Child of the upper skies
Immortal he will break the ancient bars,
Laugh, and hold out his hands among the stars."

CHILD LABOR AND CHILD NATURE

By Raymond G. Fuller
Associate Director, National Child Labor Committee

Vital to the solution of the child-labor problem is an increased popular appreciation of childhood itself; and this presupposes, of course, a better understanding of childhood. In spite of parental love for children, in spite of the claim on the part of society to have a special place in its heart for children, children even today are visited with vast cruelty and abuse—not so much a conscious cruelty and abuse, not so much a brutal cruelty and abuse, as a cruelty and abuse of adult ignorance and thoughtlessness and neglect. So many fathers and mothers know so little about children that one sometimes wonders whether they are entitled to be the fathers and mothers of children; and society, upon which also devolves the task of fostering and bringing up each succeeding generation, is not better informed or more intelligent, and a doubt similar to that concerning parents arises concerning society.

Two sources of encouragement may be noted: the first is the comparative recentness of real humanitarian regard for children, together with the results of this regard; and the second is the rapid spread of the facts discovered through scientific study of child nature in both its physical and its psychical aspects.

Beyond Economics

There are those who believe that child labor is solely an economic phenomenon, and its solution therefore an economic solution; that if we could do away with economic greed and economic pressure, we should thereby do away with child labor. They are only partly right. That is to say, child labor may flourish and indeed does flourish in the midst of plenty. It is not a matter alone of power to provide children with the things they need, but is also a matter of knowing what they need and of willingness, nay, eagerness to provide it at all costs. It is not so much a matter of economic income as it is of spiritual outgo. Unless the needs of children are understood and highly regarded, these children may receive stones instead of bread, even where prosperity is boasted.

A writer on the rural child-labor problem recently said:

"Give the farmer his just due economically and he will take care of the child-labor problem on the farm. With economic justice, he will furnish his boys and girls with every advantage." It is difficult to believe that children in the country are going to be provided with every advantage just as soon as a few dollars have been added to the farm income. The parents must know what is advantageous; they must know the meaning and value of play, the meaning and value of schooling, and the meaning and value of children's work as distinguished from child labor. We cannot wait for the economic prosperity of the country before beginning the campaign for the development among the rural population of appreciation and demand for the things that children really should have, and the things that children really should have we cannot adequately measure in terms of their future adulthood.

We often, in dealing with child labor, condemn conditions which we regard as injurious to the child's future efficiency; but the real question should be, not what kind of adulthood he is being prepared for, but what kind of childhood is he having now? There is needed a new reverence for childhood. There is called for such a reverence as shall regard growth as its own end and childhood as its own glory, without measuring everything by adult ideas or in terms of the future adulthood of boys and girls; such a reverence as shall guarantee to every child his right to have a childhood, and to enjoy it fully, and to be fully efficient in his proper capacity of being a child. The principal new value in the field of child welfare is the new value attaching to childhood as a good-in-itself.

Child-Labor Psychology

Though it is true, undoubtedly, that we need in child-labor reform a social vision, a social conception of the child-labor evil and of the objective in child-labor reform—in a word, a humanitarianism broader than the old humanitarianism of pity and tears for the individual exploited child—it is equally true that our central and dominant interest should be in the child, the child as child. He is our proper point of departure in child-labor reform. The elder economists used to talk about the economic man, as if he were a separate and distinct being from other men; but that viewpoint has been discarded. There is no economic man, merely as such. There is likewise no child laborer, merely as such. There is, instead, a child. We may consider the child in connection with child labor; we may consider child labor in connection with the child; but in either case we need to know what the child is, by nature.

Modern child psychology has taught us that in neither body nor mind is the child a miniature adult. Children are not "little men" or "little women," however much we may foolishly wish them to be, or however hard we may criminally try to make them such. Quite as truly, "little men" and "little women" are not children.

Out of the nature of children arise their needs; and out of children's needs, children's rights. As the primary and principal right of children is the right to childhood, so it is also the right to a full childhood and a normal childhood, which really amount to the same thing. What constitutes a normal childhood, and what are the environmental conditions of a normal childhood? This is the most important question in the entire field of child welfare. The answer will not be attempted here, beyond the pointing out that a normal childhood is one of natural development in accordance with developmental needs, that development of body or of mind depends on previous development, and that between physical and psychical development there is close correlation and more or less interdependence. Any occupation that interferes with a full childhood, a childhood of normal and complete development, a characteristic childhood in each of its stages, is far from being a gainful occupation.

Childhood is peculiarly and pre-eminently the motor period of life. The child's great need is activity. His nature demands it. His growth and his health, both physical and psychical, depend upon it. Without it the establishment of proper and necessary co-ordinations in the neuro-muscular system and of that constitutional unity which the ancients described in the phrase, "A sound mind in a sound body," is impossible.

What Is Play?

The characteristic mode of childhood activity is play activity, which is sometimes interpreted as a sort of resurgence, in the individual, of the racial past. It is true that play activity tends strongly to take those forms that involve the larger muscles, the simpler co-ordinations and "brain tracts that are old, well-worn, and pervious"—tendencies and powers that are racially inherited from the hoariest of hoary antiquity—but while the elements of play come from the past, the secret of play is found in the present. The secret of play is found, not in racial history, but in individual development. Yet this is hardly a fair statement, for the secret of play is itself a racial inheritance. There seems to be an inborn tendency to exercise the physical and psychical powers that are ready to be exercised and to satisfy the interests that are related to these powers. Thus play may be properly regarded as the joyous exercise of the powers and capacities, muscular and mental. It is sometimes said that play is self-expression, but perhaps it might better be said that self-expression is play.

Growth is the secret of play, and play is the secret of growth. The man who has never played at all is non-existent. He could not have grown up if he had never played. He could never have learned to know his feet from his hands, or learned to walk. For play begins with progressive triumph in the use of physical powers—powers of manipulation, of movement and co-ordination. The baby gurgles with joy as he plays with his toes, then exults in his new-found ability to creep about on the floor, then in learning to balance himself on his feet, and stand and walk. Essentially play is self-discovery and the trying out of powers—the joyous doing of what one is able to do, the exercise of ripening capacities, an exploration in the realms of muscle and mind. It is growth and development and progress.

The motions and motives, the acts and thoughts of play, are the products as well as the causes of growth. The individual in ceasing to grow ceases to play, and he who ceases to play ceases to grow. The compulsions of play are the compulsions of growth, both physical and mental; inner compulsions, not external, and therefore allied to spontaneity and freedom. Happy is the child who plays, and happy is the man who has "found his work," or, as we sometimes say, who has "found himself in his work," for in his work he has found a play satisfaction, due to its suitability to his powers and capacities, and the opportunity it affords for self-expression and self-expansion.

Play and interest are one and inseparable as body and soul, and there is no growth, no learning, without interest and the satisfaction of interest. Needs give interest, but the needs of the child are not the needs of the adult; the former are the needs of growth, while many of the latter are governed by extrinsic factors—the necessity of making a living, of doing business, of paying taxes. The adult has powers for the needs of adult life; the child has powers only for the needs of childhood, except as tremendous and devastating strain is put upon his physical and nervous system. Force upon children activities physically or mentally beyond their needs or beyond their powers, work in which they can take no interest, work which evokes no spontaneity or enthusiasm and brings no satisfaction, and you have done that which inevitably will retard or pervert their development, and prevent their all-round development, and which will seriously impair the normal functioning of the vital processes within the body and very likely sow the seeds of nervous disorder.

Let us see what the modern scientist has to say on this subject. The following is quoted from Herbert S. Jennings, professor of biology in Johns Hopkins University: "There is one method of the exercise of the powers that is almost free from these dangers, and that is what we call play. For years, play was looked upon merely as a sort of inevitable waste of time among children, but scientific study of the cultivation of these organisms has shown that play is in most respects the best, the ideal form of the exercise of the powers. Particularly is this true for the younger children, but it is in large measure true as they grow older. Play is the activity which their own natures suggest and guide; it is varied as their diverse budding capabilities require; and when free it is not carried beyond the point where one activity interferes with the development of others."

Not all work is child labor. Give a child work suited to his powers and appealing to his interests, give him work in which he can express himself, in which the instincts of initiation, creativeness and ownership are involved, in which he can use his imagination and serve purposes of his own, work that he can do with enthusiasm and satisfaction, and you have given him developmental and educative work—children's work, not child labor. This is the kind of work that he does when he joins one of the agricultural clubs now gaining a foothold in rural America. Give him also play, for much as there is in common between play and children's work, they are not the same; there is something playful in play that is not in any work. But do not give him child labor, for the results are exactly those that Professor Jennings mentions as produced by conditions in badly conducted schools: "By continued repression of many of the powers, and by forcing activity in powers not yet ready, strain is brought about; spontaneity is done away with; interest in work is destroyed; the instinct of workmanship is rooted out, hate for work cultivated in place of it." He speaks of malnutrition and nervous disturbance as among the evil consequences of such repression and forcement—consequences in no wise associated with play, except through the fact that play, and especially vigorous outdoor play, is the best of all preventive agencies and a therapeutic agency of no little value. No child labor, an increasing amount of children's work, and always an abundance of play and recreation, is the right of every child in his progress toward maturity.

One of the chief indictments against child labor is that it deprives children of opportunity to play. We do not, however, without considerable knowledge of child nature, appreciate fully what this indictment means. To rob children of childhood as playtime is to rob them of childhood itself, for as Wood says: "Children love play as all young beings love life, because life is play. The child's life is one of physical, mental and moral development. Development means self-expression, self-expression means activity, and activity means play. Children do not play deliberately from ulterior motives; with them it is play for play's sake; play is life, they live to play; they are children because they play."

It has been said that the child who has not played has missed half of life. Rather he has missed childhood, which is more than half of life, since, in Froebel's words, "The whole later life of man, even to the moment when he shall leave it again, has its source in this period of childhood." It is no exaggeration to say, as Waddle does, that the child must play or he cannot become a man; for play is functionally related to growth and development of body and mind and the integration of personality. It is the secret of all progress in the individual and the race. Norsworthy and Whitley write: "A child who does not play not only misses much of the joy of childhood, but he can never be a fully developed adult. He will lack in many of the qualities most worth while because many of the avenues of growth were unused and neglected during the most plastic period of his life."

Childhood is properly playtime, not worktime. By no means is a workless childhood implied, but the work of children should be children's work in amount and kind, and not child labor. Nor is a playless adulthood implied either as a fact or as a desideratum. Grown-ups play and ought to play. In a recent psychological essay, Professor Patrick so defines play as to include practically all the activities of children and a large share of those of adults, such, for instance, as baseball, football, tennis, golf, polo, billiards and countless other games and sports; diversions such as traveling, hunting, fishing, yachting, motoring, flying, dancing, vacation outings, games, races, spectacles, fairs, amusements and expositions; the theater, opera, moving pictures, lectures and entertainments; the enjoyment of music, painting, poetry and other arts; the daily paper, the magazine, the short story and the novel. A difference is sometimes noted between the play of children and the recreation of adults; but adults do play in response to purely and distinctly playful impulses, and children in school or at work have need and desire for that recreation which is diversional, relaxational, re-creative.

Psychology of School-Leaving

By neglect and abuse of child nature in the schools, we not only drive children into child labor but deprive them of the full educational advantages they ought to be receiving while they remain. The facts as to retardation and school-leaving are a severe indictment of the schools and of ourselves, and to a large extent are due to our failure in education to follow the lead of the child himself. Not yet has educational practice caught up with educational psychology.

"Nature has not adapted the young animal to the narrow desk, the crowded curriculum, the silent absorption of complicated facts," says John Dewey. "His very life and growth depend upon motion, yet the school forces him into a cramped position for hours at a time, so that the teacher may be sure he is listening or studying books. Short periods of exercise are allowed as a bribe to keep him quiet the rest of the time, but these relaxations do not compensate for the efforts which he must make. The child is eager to move both mentally and physically. Just as the physical growth must progress together with the mental so it is in the separate acts of a child. His bodily movements and his mental awakening are mutually dependent." These requirements of nature, well worth considering in connection with schooling, are well worth considering also in connection with child labor.

Activity in childhood, under natural conditions, becomes increasingly constructive—if the constructive, creative impulses are thwarted, the child's activity becomes less satisfying as well as less profitable. Activity, moreover, becomes increasingly social, and the work of the school is usually carried on with little of social spirit and co-operative method. Interest in vocations increases, and the schools in general fail to recognize and utilize it. These that do establish vocational training and guidance greatly reduce their school-leaving mortality. This vocational interest, at first, is not so much interest in vocations as vocations as it is the manifestation of an unsatisfied craving for the concrete and practical. The sense of practicality in the effort a child makes does not depend on the adult notion of its utility; he does easiest and best what in his present stage of development and outlook has definitely useful meaning; he learns easiest and best what seems to him applicable, and really remembers only what he applies.

One reason why children leave school is retardation, which may be the result of mental or physical defect (and this itself may have been induced by conditions of school life) or the result of a misfit between methods of teaching and the learning process. We are apt to forget that learning takes place chiefly through dealing with real situations. In human evolution, mind is the creature of crises; in the life of the individual, learning and thinking obey a similar law of mental development. We cram and stuff the child's mind with adult nutriment and wonder why he fails in avidity. Children are natural-born learners, built to learn, eager to learn—and we give the best marks, not for learning, but for reciting from books and performing memory stunts, which is a totally different thing. Learning proceeds in a large part through the operation of the instinct of curiosity. Curiosity is the basis of a large share of the intellectual development in animals and in man. Froebel called it "the bud of mind." It is to the intellect, as Kirkpatrick aptly says, what appetite is to the body. It is a cause of growth and development. "All men are curious," says Pillsbury; "from this develops love of knowledge; from that, in turn, respect for knowledge." But the child's curiosity is repressed in school, and that is another of the reasons why school displeases him. It irks him that the school leaves out and even discountenances one of his favorite and principal methods of acquiring knowledge.

Among the many causes of school-leaving is the fact that education, as ordinarily conducted, seeks to get the same results out of all children, not only neglecting, but even trying to smooth out, individual differences. Says W. H. Burnham, "A false pedagogy has exalted the value of an all-round symmetrical training and of the advantage of doing what children are not well fitted to do, and in which they are bound to fail." He quotes a report from the late Professor Dolbear:

"In antediluvian times, while the animal kingdom was being differentiated into swimmers, climbers, runners, and fliers, there was a school for the development of the animals. The theory of the school was that the best animals should be able to do one thing as well as another. If an animal had short legs and good wings, attention should be devoted to running, so as to even up the qualities as far as possible. So the duck was kept waddling instead of swimming. The pelican was kept wagging his short wings in an attempt to fly. The eagle was made to run and allowed to fly only for recreation.

All this in the name of education. Nature was not to be trusted, for individuals should be symmetrically developed and similar, for their own welfare as well as for the welfare of the community. The animals that would not submit to such training, but persisted in developing the best gifts they had, were dishonored and humiliated in many and various ways. They were stigmatized as being narrow-minded and specialists, and special difficulties were placed in their way when they attempted to ignore the theory of education recognised in the school. No one was allowed to graduate from the school unless he could climb, swim, run and fly at certain prescribed rates; so it happened that the time wasted by the duck in the attempt to run had so hindered him from swimming that his swimming muscles had atrophied and so he was hardly able to swim at all; and in addition he had been scolded, punished, and ill-treated in many ways so as to make life a burden. He left school humiliated and the ornithorhynchus could beat him both running and swimming. Indeed, the latter was awarded a prize in two departments. The eagle could make no headway in climbing to the top of a tree, and although he showed he could get there just the same, the performance was counted a demerit, since it had not been done in the prescribed way. An abnormal eel with large pectoral fins proved he could run, swim, climb trees, and fly a little. He was made valedictorian."

Professor Burnham's comment on this story is as follows: "From this prehistoric attempt at ideal education down to the present, many schools have put a premium upon failure. And from this continued effort to do work that cannot be done well, pupils are apt to acquire a slovenly attitude and like the young horse given too heavy a load at first, they acquire the habit of lying down under a difficult task. What can be more depressing than continuous failure in whatever one undertakes? As our classes are now arranged and school work ordered, it often happens that month after month many children have no legitimate opportunity to succeed. If a chance to leave school offers, naturally they take it." Frederick Burk protests against the lock-step schooling now in vogue, and adds: "There are no misfit children. There are misfit schools, misfit texts and studies, misfit dogmas and traditions of pedants and pedantry. There are misfit homes, misfit occupations and diversions. In fact there are all kinds and conditions of misfit clothing for children, but—in the nature of things there can be no misfit children."

Against conditions in school that cramp and stifle and starve and baffle, children consciously or unconsciously rebel—and go into child labor, jump from the frying pan into the fire. The child-labor problem, it cannot be too often repeated, is as much a problem of premature school-leaving as it is of premature going-to-work.

MENTAL HYGIENE

Though in school there is much violation of the nature of children, both in positive and in negative ways, it is still more common in child labor and is one of the explanations of the fact that working children do not stay in their jobs. At any given time only one-half of the child laborers under 16 years of age are actually at work. The child laborer is the father of the shifting worker—the last to be hired and the first to be fired. And hysteria, we are told, is pre-eminently a disease of the unemployed or the aimlessly employed.

All the most characteristic strains of modern civilization fall upon the nervous system, which, as Dr. Gulick points out, is the latest system of the body, biologically and genetically, to reach its full complexity of development—and the part most easily shattered. "We have begun to recognize," he says, "the importance of muscles in the normal growth of personality. The nervous system and the muscular system are so vitally inter-related in the carrying on of all life's central activities, that to educate the former without making provision for the latter is fool's economy." In child labor there is no provision for either. But the inter-relation of body and mind in normal development goes farther than we commonly recognize. Says Dr. Jellife: "*Mens sana in corpore sano*,—a healthy mind in a healthy body,—has been the watchword of past civilizations. It is time to modify this and to recognize that this is but one half of a truth, which in order to be realized needs to be stated in a larger form which embraces this. *Corpus sanum in mente sana*,—a healthy body can only exist as its behavior is influenced and controlled by a healthy mind."

Much is involved in child labor that is quite unfavorable to mental as well as to physical health. The general popular conception of child labor is one that is still limited very largely to the physical and physiological aspects of the evil. Not only does it fail to place due emphasis on the indirect effects of child labor—the deprivation of play and of schooling—but it fails, as regards direct effects, to emphasize sufficiently the psychical side of the child-labor experience. The abolition of child labor and the establishment of its substitutes, particularly suitable schooling, suitable play and suitable work, is a task of mental hygiene.

The nervous disorders and derangements in which child labor may be a contributing factor are of great variety. They range all the way from slight abnormalities to functional disease in which the power of sight, or the use of arms or legs, has been lost. Of special significance from our present standpoint are the so-called "neuroses of development," commonly described under such heads as chorea, dementia praecox, hysteria, psychasthenia. Chorea is a disease of childhood; and dementia praecox, of youth; and the roots of most functional disorders of adulthood have been traced back into the earlier years. It is asserted that five per cent of our school children are neurotics in the sense that they are more than ordinarily predisposed to the formation of mental "complexes" unfavorable to the healthy and co-ordinated functioning of intellect, emotion and will. Most child laborers are in that particular period—early adolescence—when neurotic disturbances are peculiarly liable to appear and become seated. Too little consideration is given to the tragedy and cost of preventable nervous disease. It is said that the growth of insanity in this country is outstripping that of population. The lesser mental ills, we are told on good authority, are increasing with even greater rapidity. The time of prevention is childhood, but we are doing to children what we should not do—making them men and women too soon. The mental hygienist as well as the modern educator knows that nature would have children be children before they are men and women.

Nature, instead of telling the child to grow and develop and instructing him in ways and means, endowed him with the play impulse. Play, as spontaneous, self-expressive activity, is always according to nature. It conforms at every moment of the child's life to the genetics of his growth and development. On the positive side, it reflects the neuromuscular co-ordinations established at the time and establishes those that are ready to be formed. It reflects also the various instinctive tendencies (or many of them) as they ripen—and helps to ripen and strengthen them. In short, it obeys the self-finding and self-developing push within the child. On the negative side, it respects the limitations of the child as regards those neuro-muscular co-ordinations and psychic motives. In true play no movement is made or action performed ahead of its natural and normal time—there is no unreadiness of body or of mind for that movement or that action. Thus it fosters no prematurities or precocities of physical or psychical or psycho-physical development. Its activities, being timely not only, but interesting, since interest and play are integrally related, are without that defective psychic motivation so common to child labor and so favorable to cumulative fatigue, which in turn is favorable to the inception of those dread diseases of personality, the neuroses and psychoses.

Child labor, in many of its forms, constitutes a repressive environment. It is no respecter of the instinctive needs, developmental demands, and natural interests and desires common to all normal children. It is no respecter of individuals and of their differences in interests, aptitudes and abilities. It is often the case that free bodily movement is denied and that proper periods of relaxation are not given. Labor-saving devices in the factory have rendered work more sedentary, depriving the large, basal muscles of their due proportion of exercise and at the same time making an excessive demand for the fine and exact movements of the small, accessory muscles, with an accompaniment of severe nervous effort and strain. What is true of adult workers as industry has become more and more specialized is true of the children in their even more mechanical occupations—personal initiative, personal responsibility and personal interest in results have less and less opportunity to function. Constructiveness, self-assertiveness, sociality, playfulness—these instincts and desires are thwarted and balked in child labor, and on the farm as well as in the factory. For these and other reasons, much of the work of the child laborer is done with defective motivation. Sometimes it is motivated by fear. We find in child labor an involuntary servitude of children to purposes not their own and really beyond their powers—a servitude in what to them is a foreign land—a doing of things which they cannot do. Lacking, of course, is that natural spontaneity and enthusiasm of childhood and youth upon which the symmetry of psychic life and growth depends.

Defectively motivated work—work that is done with psychic fiction—probably leads directly to nervous disturbance and disorder, as well as indirectly through the fatigue it occasions. It produces emotional effects of some kind. It upsets the emotional equilibrium to some extent. Something happens in consequence of the repressed instincts, thwarted interests and balked desires of the child laborer. Surely this is true: if the child cannot do what he wants to do, what he is instinctively impelled to do, he can think—he can wish and dream in terms of his normal impulsions. But his thought-life is denied the test of actual application. A cleavage comes between thinking and doing. Queer complexes are built up, manifesting themselves in queer behavior. John B.

Watson puts the matter thus: "Activity is the natural setting and very nature of all mental growth. As has been said, 'The laws of mental health and of character require the completion of thought or feeling by expression in action.' Thus feeling and thought and fancy which are not brought to the test of action, to their fulfilment in action, tend to become one of the danger points of human nature."

The psychical side of the child-labor evil might be stated partly in terms of suggestibility. Children are more suggestible than adults. Fatigue enhances suggestibility. In child labor we have a combination of the two factors. Suggestibility and fatigue may become psychopathic, with consequences many and serious. Conditions which involve fatigue and particularly the cumulation of fatigue, which lower the general physical tone, which separate the child from his own natural society, which destroy self-confidence and initiative, which starve the instinct of workmanship instead of feeding it, which present an experience of repeated failure, which are marked by such concomitants as worry and fear, or which fail to develop a rich fund of wholesome, objective interests, are conditions found in child labor and in the etiology of nervous diseases and personality disturbances of various sorts. Sanifying and prophylactic are interesting, fruitful work, well suited to the individual's powers, and plenty of play. Here we come again upon the distinction between child labor and children's work, another name for suitable work, and upon the deprivation of play as one of the worst features of the child-labor evil. It is incontrovertible that there would be less mental ill health and deficiency among adults today if there had been in past years less child labor and more childhood play.

The enormous child-labor overturn has its own significance from the standpoint of mental hygiene. In considerable part it is doubtless due to the adolescent restlessness—this changing from job to job—but other factors operate. The instincts, interests and desires thwarted, it may have been, in school, such as those of initiative, constructiveness, curiosity, are likely to be thwarted again to child labor. There is disappointment and disillusion, with usually no counsel to mitigate the shock or help the child to adjust himself to the new conditions; no aid is given toward the achievement of a normal outlook on life and work. The child tries one job after another, vainly seeking satisfaction or self-expression. There is intermittent work and idleness. Under conditions such as these, of course, little is gained in the way of vocational training or of helpful discipline. Indeed, the result is quite otherwise in very many cases. Habits of vacillation, of change and of failure are formed, leaving their marks in weakened will and character. Repeated failure in this period affects the mental health seriously and permanently, and with the child of neurotic constitution it is highly dangerous to mind and personality. Professor Burnham writes: "From continued success through many years an attitude of confidence is developed. On this largely morale depends, and to many cases it is an essential condition of normal development and mental health. Continued failure, on the other hand, is liable to develop an unsocial attitude, the shut-in personality, and to plant the seeds perhaps of mental disorder."

Not cities, nor city streets, nor factories are the true homes of childhood, but rather the fields and forests, the rivers among the hills and the shores of the sea. The city is a false environment for children, even the confining walls of the schoolhouse, but how much more so is the factory with its manifold noises, its monotonies of noise, its rhythms false to nature. Other sounds and truer harmonies—the notes of birds, the sighing of winds through the pines, the murmur and babble of brooks—these are a fitter environment, which, alas, we can now provide for many children only in abbreviated and vicarious ways. As of sounds, so of sights: views of the mighty ocean and of broad plains; sunrise and sunset; a bed of wild flowers; the colors of nature herself. As Hall, Curtis, Gulick, Patrick and others have been telling us in their discussion of play, the natural activities and proper environment of children go back to the activities and environment of primitive man—to simple, elemental things. So far as possible, we must enable children to lead the simple life and the life of play; we must mitigate for them, to the best of our ability, the stress and strain of urban life. But even in the country places, in the great original out-of-doors, children are growing up under conditions not in keeping with the needs and demands of their own natures.

Child Labor vs. Children's Work

Nothing could be farther from the truth than the rather widespread notion that child-labor reform is predicated on the assumption that children should have no work whatever to do. It must be said, however, that the belief that children should have work is responsible for a good deal of child labor. Though much has been done by society to abolish child labor, little has been done to establish children's work on a proper basis. Society has made no serious constructive attack on the children's work problem, but sooner or later we must come to grips with this problem. The school has not done its part toward answering the true work needs of children; neither has the home, and the urban home is under a heavy handicap in this regard. Instead of enough children's work we have had too much child labor. As part of the solution of the child-labor problem, as a means to the abolition of child labor and the breaking down of opposition to reform, we must give attention to the work that children should have and see that they have it. To establish children's work is quite as important as to establish children's play or to abolish child labor. These are all aspects of a single problem.

Let us consider for a moment some of the supposed values of child labor. In defence of it we have heard the assertion that it furnishes training in the sense of responsibility and in the habit of thrift; and that it affords the discipline of self-subordination to unpleasant tasks. However, there is abundant opportunity for developing the sense of responsibility in the home and the school through household duties, home-projects under school auspices, schemes of self-government and so on. The same is true of thriftiness. Moreover, thrift is not merely a matter of money, and the virtues connected with it may be developed in relation to school supplies, home possessions, food and clothes. Child laborers have not yet been shown to be especially thrifty with their earnings. As to the disciplinary value of child labor, modern psychology teaches that the only discipline that is worth while is that which accords with the child's own nature, his instincts and desires—not all of them of course, but a selected few. It is not the discipline that runs counter to his nature, resulting in nothing more than sullen obedience or strained submission. This latter kind weakens or breaks what we sometimes, rather inaccurately, call the will. The activity that develops the will is willing activity. Work performed in accordance with the child's own purposes and desires has far more disciplinary value than drudgery, which stifles initiative, individuality and expressiveness, all of which may be enlisted in the service of character-building and without which there is no character.

The assertion, which is not infrequent, that doing away with child labor would do away with experiences that develop vigor of personality and strength of character, that it would make children's lives too soft and easy, might be answered by a question, Why child labor for some children and not for others? Parents seldom want their own children to be child laborers. This is never the wish of educated and well-to-do parents. Child-labor reform does not seek the removal of obstacles and difficulties from the lives of children, but only obstacles to development and achievement. There is nothing prejudicial or weakening to character in suitable schooling, suitable play or suitable work, the three principal substitutes alike for child labor and child idleness; these on the contrary challenge and exercise and discipline all the growing powers of the child, leading to self-development, self-control, self-discovery, self-confidence and the fulness of selfhood.

Psychologically, the fundamental characteristic of child labor is unmotivated activity—or activity motivated from without rather than from within. Some forms of activity involved even in school work may be described as child labor. They are beyond the child's needs; that is to say, beyond his powers, except as they are externally motivated or artificially forced. They may run directly counter to his needs; for instance, his need of free bodily movement or his need of interesting occupation. Child labor in the schools is one of the chief causes of child labor in industry and agriculture and on the streets. Child labor out of school is often entered upon as a means of escape from child labor in school. Schooling must be somehow reconciled both with what goes on inside the child and with what goes on outside the school if it is not to be child labor.

The criteria of children's work are numerous. We shall mention only five: (1) Children's work leaves plenty of time for schooling and for play. (2) It is performed in suitable places. (3) Children's work is of a kind that not only is not injurious but is positively favorable to physical and to mental development and health. (4) It is educational in the sense that has to do with one's accumulating fund of knowledge (as well as with the educative process and mental power). (5) Children's work is supervised work. The supervision may be slight, but it is there, and it is always in the interest of the child himself.

In distinguishing between child labor and children's work, very definite psychological facts and principals are available for guidance and aid. This from John Dewey is suggestive: "To confine the growing child to the same kind of muscular activity is harmful both physically and mentally; to keep on growing, he must have work that exercises his whole body, which presents new problems, which teaches him new things, and thus develops his powers of reasoning and judgment. Any manual labor ceases to be educative the moment it becomes thoroughly familiar and automatic." Child labor is child labor partly because it is not educative in this psychological sense. It does not give the child experience in solving problems and coming off well from situations; it does not, in other words, develop intelligence.

To illustrate further the educative possibilities of work in contrast with conditions characteristic of child labor, let us take the situation of the children of tenant farmers as Charles E. Gibbons found it in Tennessee. "The kinds of work the children are called upon to do in the one-crop sections is not training them to be any better farmers than their parents. It is mere drudgery and wholly uneducational. It does not teach them thrift and economy, for the parents as a rule get all the returns from their labor; in fact their labor is simply a 'board and keep' proposition. Out of 112 tenant parents in Tennessee only 18 reported their children owning anything, such as a pig, calf, acre of corn, cotton, etc., and receiving the profits therefrom. There is nothing in this drudgery that centers interest in the farm." Farm work is not drudgery to children if it be work in which an intelligent interest has been developed through agricultural clubs or through schools related to rural life; but it is drudgery and it is child labor when it is meaningless labor or forced labor or in any way excessive.

Uninteresting work is fatiguing work. "A man with no interest is rapidly fatigued," said Galton; and so is a boy. A boy can do more work with less fatigue and injury if it possesses that element of interest which is characteristic of children's work. Work in which the movements themselves rather than the thing to be done require attention, in which the action springs from the mind of another or from external compulsion rather than spontaneously and purposively from the mind of the doer, causes a large nervous expenditure for a small muscular result and tends towards excessive fatigue. O'Shea remarks: "Observe a boy at play and at work. The play may really be harder, in the sense that more gross energy may be expended and more difficult movements are performed, but yet he is really less fatigued over the heavier than the lighter task." The difference is one of interest, and it is interest that levels the distinctions between play and the work that is not drudgery. Interest is fundamental not only to play and to children's work, but to the learning process, regard for which is one of the criteria of children's work. Woodworth says that a trade or profession "cannot be learned without getting interested in it directly and on its own account."

Dewey shows the relative value of the school and of work in a store in furthering the educative process: "The grocer's boy knows what a peck is because he has used it to measure things with, but since his stock of knowledge is not increased as he goes on measuring out peck after peck, the point is soon reached where intellectual discovery ends and mere performance of a task takes its place. This is the point where the school can see that the pupil's intellectual growth continues; while the activity of the mere worker who is doing the thing for its immediate practical use becomes mechanical. The school says the pupil has had enough of this particular experience; he knows how to do this thing when he needs to and he has understood the principles or facts which it illustrates; it is time he moved on to other experiences which will teach him other values and facts. When the pupil has learned how to follow a receipt, how to handle foodstuffs, and use the stove, he does not go on repeating the same elementary steps; he begins to extend his work to take in the larger aspects of cooking. The educative value of the cooking lessons continues because he is now studying questions of food values, menus, the cost of food, and the chemistry of foodstuffs, and cooking. The kitchen becomes a laboratory for the study of a fundamental factor in human life."

Almost nobody believes in child labor, and almost everybody believes in children's work. Mere recognition of the fact that a difference between the two exists—and that is by no means universal among parents and citizens—is not, however, the whole end of the difficulty. It must be understood wherein they differ—how they differ. As the data of scientific research accumulate, we must in course of time set up for the guidance of parents, schoolmen and administrators of the law clearer standards of what constitutes children's work as distinguished from child labor. We are setting up standards of physical fitness for children entering industry and are thinking a little about setting up standards of mental fitness. We are measuring children with reference to their fitness to go to work, but we ought also to measure work with reference to its fitness for children. We ought to know very precisely what kinds of work are especially suitable to boys and girls in their various stages of development. This, to an extent, vocational guidance is attempting to do; but, important as it is to distinguish between suitable and unsuitable jobs, this is not quite the same thing as to distinguish between suitable and unsuitable work. The latter distinction will serve in making the former, but it has to do with the child's work needs rather than his vocational needs. The work needs are psychological rather than sociological. What they are exactly and how they are best and most fully to be met are questions calling for knowledge far beyond that represented in the child psychology and the educational practice of the present day.

That children have work impulses and needs as well as play impulses and needs, and that they should have the experience and discipline of suitable work activities, is not to be gainsaid. The public school has a responsibility not only for the formal schooling of children and for the enrichment of their play life, but also for the enrichment and partial guidance of their work life. They should educate not only through work, but for work; and not only for adult work, but for children's work. The schools are beginning to recognize their proper relation to work activities outside the school. Some of them are allowing credit for milking the cow, caring for the horse, splitting kindling-wood, sweeping and dusting the house and caring for the baby. But merely to give credit for the performance of home tasks and duties is not enough. Children should be helped in school to a more efficient and intelligent usefulness in the home. Meriam, writing of the relation of the school to home life, says: "Boys and girls waste a great deal of time at home because they do not know what to do . . . . Every boy should have some sort of shop at home, which may be equipped very meagerly at first; it will be better equipped when its value is discovered. The girl does not call for a special space called a shop; the whole house is hers. Knowledge, direction, and encouragement to make things useful or artistic, or both, are needed; there is scarcely a home which does not need this constructive work on the part of the children. To instruct children in handwork, not as a school exercise, but as an occupation that should have a large place in the home, is the opportunity and the obligation of the schools."

It is greatly to be regretted that vocational training and part-time schools are so often recommended and urged with too little thought of their developmental value—their effect on the child. Our vocational education suffers from the pressure and domination of the industrial institution; and the industrial institution does not exist for the satisfaction of children's needs. Says Helen Marot: "The institution of industry rather than institution of education, dominates thought in industrial education courses. It is the institution of industry as it has affected the life of every man, woman and child, which has inhibited educational thought in conjunction with schemes for industrial schools. No established system of education or none proposed is more circumscribed by institutionalized thought than the vocational and industrial school movement." The vocational education of today is almost as far from meeting the needs of children as children as the older traditional education. Just as the latter has overemphasized subjects to the neglect of child nature, so the former is now overemphasizing vocations. In both the traditional and the vocational curriculum, the content of the whole is divided, subdivided and parceled out according to what is believed to be the child's ability at his age—that is, the starting point is the subject or the vocation itself, not the child. Growth, however, is the really important consideration. The vocational curriculum has the advantage in that it involves more action—especially action of body and mind together—and that it also makes the appeal of the concrete and practical.

In considering the true work needs of children, we have to consider the child, not industry or production, and not the economic condition of parents; and the responsibility of the schools in regard to children's work will not and cannot be met by any method which fails to emphasize first and all the time the growth, development and education of the child himself.

CHILD LABOR AND MENTAL AGE

By Raymond G. Fuller

The distribution of degrees of intelligence among the general population, as indicated by the army tests, has been the subject of considerable discussion. It appears that, excluding the lowest grades of feeble-mindedness, ten per cent of the population is of "very inferior" intelligence; fifteen per cent, of "inferior" intelligence; twenty per cent, "low average"; twenty-five per cent, "average"; sixteen and a half per cent, "high average"; nine per cent, "superior"; and four and a half per cent, "very superior." Or, otherwise stated, ten per cent is limited to a mental age of not over ten; twenty-five per cent, of not over eleven; forty-five per cent, of not over twelve; and seventy per cent, of not over thirteen or fourteen. On the assumption that the age-grade progress of school children corresponds with their intelligence, it has been concluded that seventy per cent of our boys and girls are incapable of acquiring a high school education; twenty-five per cent, of going beyond the fifth grade; and ten per cent, of finishing the fourth. It has been pointed out that, according to the figures of the federal Bureau of Education, thirteen per cent of our school children actually do drop out in the fourth grade or earlier and that sixty-nine per cent do not complete the eighth grade.

Before accepting it as true that early school-leaving is wholly or chiefly due to deficient intelligence and that continuance in school is dependent on the grade of intelligence, it might be well to measure the mentality of groups of children who have left school—working children, in particular—and compare the results with results obtained by examination of children who have stayed in school. There is some reason for believing that a large proportion of working children are of rather high degrees of intelligence and that success in school is not entirely dependent on sheer intelligence. Binet says that "memory is a great simulator of intelligence," and we might add that with the methods in vogue in our present schools it is in many cases a pretty good substitute. We should keep in mind the fact that intelligence tests do not by any means measure the whole of ability and do not discover special aptitudes and abilities. Great ability may go with small intelligence; such traits as initiative, originality, loyalty, determination, persistence and pluck represent ability.

In saying this we are on debatable ground, but instances in support of the statement could be cited. It is not a denial of the existence of a close correlation between "intelligence" and "moral qualities," though conclusive proof of such a correlation has not yet been adduced. A correlation, however, does not necessarily mean that the "moral qualities" are incapable of being trained and developed beyond "intelligence." Taking "morality" in the ordinary meaning of the term, we have reason to believe that it flourishes among the intellectually humble of the population. We have long been accustomed, in public affairs, to place a good deal of reliance on the morality as well as the good judgment of "the common people." It is the common man, we should find it hard to deny, who is most strongly bound by the folkways and mores, by custom, tradition and public opinion. But rather startling is the fact that Dr. Herman Adler, who recently gave the army mental tests to all the inmates of all the penal institutions of Illinois, found that the distribution of intelligence for this group is the same as that for the general population. This may mean simply that the tests do not measure morality at all, or it may mean that the correlation of morality with intelligence is negligible.

Taking the conclusions drawn from the army mental tests at anywhere near their face value, surely we must regard them as having a very direct bearing on the question of a sixteen-year-old standard for leaving school and going to work. It is a psychological question as well as a physiological one. Why keep children in school if they are incapable of profiting by staying there? But maybe they could profit if we had different schools from those we have today. It has been suggested that the data on intelligence levels point to the necessity of picking out the children of the higher grades of intelligence and seeing that they are enabled to go on. The idea is that social and political salvation depends on a trained aristocracy of intelligence and that the schools belong to that aristocracy. The incapables may be charitably taken care of through special classes or may be allowed to depart at an early age. But, after all, do the schools belong to that aristocracy—to the few who are favored mentally, any more than to the few whose parents are favored with money? Do the high schools belong to the small minority who are able to complete the course? Would it not be just as wise to adapt the school system primarily to the needs of the eighty-five per cent who are now supposedly incapable of profiting by staying in school until they are sixteen? And provide the special classes for the highly intelligent? Would it not be just as wise to emphasize the educational needs of the group of "high average," "average" and "low average" intelligence (sixty per cent of the population) as the needs of the "superior" and "very superior" group (thirteen and a half per cent)?

It is of course impossible to raise the mental age or level of intelligence by education, but it is possible, without doing that, to increase individual efficiency and social fitness by suitable methods. In the new schools for the masses, manual activity should have a large place. Individuals of low and average intelligence have instincts and, therefore, are capable of forming habits; so habit formation should be one of the principal tasks of these new schools. Imitation and memory are other resources to be drawn upon for educational purposes. Allowing or forcing children to memorize lessons, instead of requiring the exercise of intelligence that develops intelligence, is to be condemned; but, on the other hand, memory training can be neglected to the detriment of the child. Though it is true that nothing can be added to native retentiveness, few capacities are susceptible to greater improvement than memory. Binet's remark that "memory is a great simulator of intelligence" should not lead us into an attitude of scorn, but should suggest that memory, because of its close resemblance to intelligence as evidenced by performance and behavior, is entitled to some respect. The fact that in the construction of the army group tests it was attempted to make them "as completely independent of schooling and educational advantages as possible" leads us to suspect that there are in performance and behavior other elements of ability than sheer intelligence as measured by such tests, and that these elements are in some way related to "schooling and educational advantages."

It should be noted that, in the opinion of prominent educators, children whose continuance in our present schools is due to persuasion profit by remaining there. "It is well known," declares Professor E. C. Hayes of the University of Illinois, "that of those who leave school without completing the first four grades, great numbers do so for other reasons than the lack of natural mental ability. And while the results of personal observation must be regarded with caution, we may say with justification that observation of the public schools renders the statement that seventy per cent of the population are incapable of acquiring a high school education nothing short of preposterous." It is certainly doubtful if a large or a small attendance in the upper grades of school in some cities corresponds with the level of juvenile intelligence in those cities. In other words, cities probably do not vary in the degree of juvenile intelligence so much as they do in their records for school attendance in the upper grades.

However, intelligence levels as determined by mental tests carefully administered and interpreted have a very direct meaning for the problem of retardation in school work and early school-leaving, and accordingly for the child-labor problem. Lewis M. Terman, discussing mental age as a basis for school grading, says: "The significance of mental age for the teacher lies in the fact that it can be used as a basis for grading the pupils so as to secure class groups of homogeneous ability. The pupils of given grades, or even the pupils of one grade in a single classroom, are far from equal in general intelligence or in ability to master the school work. Generally speaking, not far from a fourth of the pupils in any given grade have a mental level too low to make satisfactory work in that grade possible, while another fourth have reached a mental level which would enable them to succeed in a higher grade." Elsewhere the same author writes: "While we cannot hold all children to the same standard of school progress, we can at least prevent the kind of retardation which involves failure and the repetition of a school grade. It is well enough recognized that children do not enter with very much zest upon school work in which they have once failed. Failure crushes self-confidence and destroys the spirit of work. It is a sad fact that a large proportion of children in the schools are acquiring the habit of failure. The remedy, of course, is to measure out the work for each child in proportion to his mental ability." This will help prevent the premature school-leaving which constitutes one of the main points of the child-labor problem.

Sub-normal children—those of the moron type or lower—present a special problem from the child-labor standpoint. Several states provide for the issuance of working papers to children below the regularly prescribed age if they fall in groups variously described in the statutes as "backward and sub-normal," "mentally deficient or sub-standard," "mentally retarded and unable to make further advancement in school." This exemption is not without its serious dangers. First, there is the serious danger of a loose interpretation of the descriptive terms; then there is the further danger of an inaccurate determination of the child's real mental status. The exemption should be always safeguarded by provision for reliable diagnosis and for training, placement and supervision. There are excellent reasons for not keeping dull or defective children in school in the same classes with normal children, but none for turning them loose into industry without the protection and guidance which they, above all others, need. Special classes and schools are the commonly accepted solution, but Connecticut is to try out a novel and promising plan of vocational probation. This is to operate primarily through the Juvenile Court and probation officers, but involves for its successful working out the close co-operation of court and school officials and employers. Any valid dealing with subnormal children from the standpoint of child labor or from any other standpoint demands from the public generally just what is demanded in the case of normal children—a new and better understanding of their needs and possibilities. And the possibilities of useful and happy living, even for those children who must always remain children, are, through wise and devoted training, greater than we commonly suppose. (We are speaking here not of development, but of adjustment.)

William McDougall, in the title of a recent book, raises the question, "Is America Safe for Democracy?" The question, in his opinion—and he does not limit his discussion to any particular country—is whether the people, biologically speaking, possess the mental and moral qualities, the inborn capacity adequate to the tasks and responsibilities of an increasingly complex and increasingly democratic civilization. McDougall doubts that improved and extended education can sufficiently prepare the rising generations for their tasks and responsibilities, since the efficacy of education (or the educability of the individual) is strictly limited by innate capacity; and innate capacity, as indicated strikingly by the army mental tests, is not very great among the majority of people. "Education," of course, he uses in the broadest sense. McDougall reaches the eugenic answer. Conklin is perhaps more optimistic about education, but makes a similar suggestion. The future is to be guarded against decline and disaster, "not merely by improving the conditions of individual life and development and education, but much more by improving the ideals of society and by breeding a better race of men who will 'mould things nearer to the heart's desire.' " But this problem of breeding a better race of men presents difficulties. For compulsory eugenics—even as applied negatively to the very lowest class of mental and moral deficients—is not easy of accomplishment in a democratic society. There remains voluntary eugenics. But this depends on "the eugenic conscience"—and how else can the eugenic conscience be developed except through education? If the mental and moral qualities of the American people (or of any other people) are inadequate, even with education, to the maintenance of the level of the civilization of which we are the present bearers, they are certainly inadequate, without education, to the adoption and carrying-out of the measures, either compulsory or voluntary, necessary for the solution of the problem of breeding that better race of men which is said to be needed.

The same thing, in general, is true not only of eugenics but of any other proposal for the salvation of civilization and democracy by effecting a readjustment between human capacity and the heavy demands made upon it today in the solution of personal and public problems. The complexity of social and economic life may be too much for us, and may be increasing in complexity while our capacity remains static; if so, there is a problem of simplifying social and economic life that requires the exercise of such capacity as we do possess, augmented and strengthened by an education intensive as well as extensive. By an intensive education we do not mean anything resembling the practice of "cramming" for examinations. We mean, for one thing, the cultivation of tastes and satisfactions other than those which dominate our present activities; for if we are to reform our quantitative civilization we must reform our qualitative selves. We need in our modern age a new paganism. This is a matter not of reversion but of conversion—and of education. We need more of that paganism that Wordsworth wrote about:

"The World is too much with us; late and soon,
Getting and spending, we lay waste our powers;
Little we see in Nature that is ours;
We have given our hearts away, a sordid boon!

"This Sea that bares her bosom to the moon,
The Winds that will be howling at all hours
And are up-gather'd now like sleeping flowers,
For this, for every thing, we are out of tune;

"It moves us not.—Great God! I'd rather be
A pagan suckled in a creed outworn,—
So might I, standing on this pleasant lea,

"Have glimpes that would make me less forlorn;
Have sight of Proteus rising from the sea;
Or hear old Triton blow his wreathéd horn."

We need, besides this Wordsworthian paganism, a religion of service. The world in which we live and move and have our being is the product of creative idealism—the spirit of man made manifest. To have within us new aims of action and effort, new conceptions of success and objects of attainment, is to create a new world without. The having of these aims is a goal of self-realization, and self-realization is the central problem of what we have called intensive education. Says Patrick: "Possibly there is a higher kind of self-realization than that found through self-expression. Self-realization may indeed be the highest goal of human endeavor, but the self to be realized may be the larger self of our collective being, including succeeding generations." In this light self-realization is one and the same thing with the religion of service.

There is a field for intensive education in developing not only new attitudes and ideals, but in sharpening and perfecting the mental tools with which we work. The existing stock of mental and moral powers and possibilities, neglected and unrealized among the people as a whole, is capable of greater service to individual and society. Stewart Paton has faith that all is not lost or hopeless: "There seem to be a good many people who are very much concerned about the question whether civilization, having reached its highest point of development, has begun to decline. Some Jeremiahs are lamenting that the human race, having passed through the period of infancy, youth, and manhood, has already reached old age. As a matter of fact, there is plenty of evidence that man is still in a very early period of his development. He has always treated his brain, for example, very much in the same manner that a child does a complicated toy, and he takes little trouble to find out how to use this organ to the best advantage. Like a child, he has done a good deal to impair its efficiency, and he only appeals for aid in learning how to manipulate it after serious damage has been done to the machinery." The Princeton psychologist says that "One result of this childish attitude has been the development of a sentimental and rhetorical, but not intelligent, interest in discussing the matters affecting his welfare such as peace and sanity, while he actually undertakes very little in a sane way to find out which processes should be cultivated and which eliminated, in order to develop a rational and peaceful attitude of mind. He wishes intemperately for international peace and sanity, but he takes few steps based upon any scientific knowledge of human behavior to bring about the fulfilment of his dreams." We have by no means exhausted the possibilities of human capacity, whatever may be its limitations.

That is exactly what education means, to take human capacity and make the very most of it. We must do that regardless of the eugenic prospect, and in so doing we shall fulfil the democratic ideal.

We sometimes speak of constructive democracy. What democracy could be more constructive, more truly constructive, than that which begins with children? In a recent book, Stephen Leacock discusses "The Unsolved Riddle of Social Justice," seeking to point some way of escape toward neither the Scylla of *laissez faire* nor the Charybdis of socialism, and his final word is this: "The safety of the future lies in a progressive movement of social control alleviating the misery which it cannot obliterate and based upon the broad general principle of equality of opportunity. The chief immediate direction of social effort should be towards the attempt to give to every human being in childhood adequate food, clothing, education and an opportunity in life. This will prove to be the beginning of many things." No doubt Professor Leacock would include health among the essentials of a democracy of childhood, and construe opportunity to include opportunity for development of all inner capacities and potentialities. The road to democracy is through democracy—and through the child. There is no such thing as democracy among an unprepared people.

The child, according to anthropologists, possesses in himself "all the chief distinctive characters of humanity," and "the true tendency of the race is to become childlike." Such thinkers as Havelock Ellis and G. Stanley Hall aver that the child and the woman are the better and more adequate representatives of what is best in the race and in life. Waddle inquires: "May it not be that woman stands for the best things in life, because, far more than man, she follows the lead of the child, understands childhood better, sympathizes more with it, and appreciates it more truly?" One cannot but wonder what effect it would have on the quality of nations if nations should follow the lead of the child, spend their thought largely upon him, make him their principal object of devotion. Perhaps we should then approach to childlikeness of some sort in citizenship, statesmanship and diplomacy. Would this, after all, with its simplification in many ways of both the inner and the outer world of man, be so bad a thing? The child has been declared, on the highest authority, to be the symbol and type of the Kingdom of Heaven. It is time that the child be given his rightful place in this world and in this country. The twentieth has been called the "Century of the Child." Let us make America the Nation of the Child.

NOTES ON THE PSYCHOLOGY OF RECREATION

By G. Stanley Hall

Biology has made us familiar with the pregnant fact that evolution means specialization. In primitive forms of life a simple cell performs all vital functions—sentient, motor, secretive, nutritive and even procreative. But with the development of the soma and its organs the activity of each cell group becomes more and more limited in scope and more differentiated from others in structure, more efficient in performing its own special functions and less capable of and so more dependent upon others. Thus the corporate welfare of the whole involves ever more limitation of the range of activity of each physiological element. All know and no one denies this principle.

What we have not yet fully understood and still less accepted in its practical consequences is that precisely the same law is just as true and fundamental for human society and all the manifold institutions of civilization. The individual must give up many things and focus upon one and learn to do that ever better in order to become a true socius, and must realize that he is but a small part of an ever larger whole. *In der Beschränkung zeigt sich der Meister* (Mastery comes by focalization) is true in industry, trade, government, in every profession, in all the arts and sciences and perhaps most of all in original research. The world of today and yet more that of tomorrow will be ruled by those who know and do one thing supremely well. Thus not only to excel and to become leaders and lights in any field, but even to escape a paralyzing sense of inferiority, involves ever more renunciation of the countless other things one would like to be, do and know; and this involves progressive limitation of the ensemble of very much that constitutes personality and increasing subordination of the individual to the welfare of the group. The difficulty of finding the one thing each can do best and of duly concentrating on it in time to achieve mastery, and the consequent docility and recognition of the authority of experts in other fields, is the chief cause of present unrest and the chief peril of democracy.

Thus what to do with man's undeveloped potentialities becomes a problem of ever growing gravity. Most, save geniuses whom nature starts early toward their own true goal, drift or circumnutate for a time till accident rather than competence determines their career; and so, later realizing that they might have done better, they come to feel that the social, industrial or political order is unjust. Thus the progressive renunciation that service under modern conditions requires inevitably breeds a growing body of discontent and distrust; and the individual cells and organs of the great community body tend to set up for themselves in a way and degree that means more or less renunciation of membership in the whole, and this involves disintegration and decadence. It is just these disruptive tendencies which were the chief psychological cause of the decline and fall of the great civilizations of antiquity and which now threaten our own as nothing has ever done before. It is useless to objurgate these trends toward individual and group selfishness, and emergency legislation can never eradicate them, for they are inveterate, if not legitimate, at the present critical stage of man's development when Teufelsdrock's clothes are both outgrown and worn out and he needs not only a new suit but new fashions based upon new measurements of human nature itself, though it is proving very different and vastly more complex than what we thought it when the old garments were made. This is the colossal task now laid upon modern man, but we are optimistic enough to believe that it will sooner or later be accomplished; otherwise we face a period of debacle and relapse to feralism, the contemplation of which is painful to face.

My modest purpose here is merely to call attention to the peculiar rôle of certain forms of diversion, which become of vastly greater significance in eras of suspense and transition like the present. Although we cannot avoid the necessity of harder and ever more specialized work of body and mind, we can and must, at least at times, turn away from it and find not only diversion but recreation in so doing. The old law, that those work best who play best, simply means that the best preparation for the severest labor is the completest relaxation. Amusement is often more than rest; it is rejuvenation. What we need is to exercise unused muscles and psychic powers and appetencies, which the conditions of modern life tend to relegate to innocuous desuetude; and this recalls the old slogan of the Turners: that a man is whole only when he plays. As many children's games and spontaneous activities are vestiges of what were once the most serious occupations of adults, so most humor, satire and amusements generally are flights from the exaction and drudgery of occupational life to the more primitive states and attitudes characteristic of the childhood and youth of the world and of man. Without such flights from reality man loses elasticity, recuperative power, poise and even sanity, and may take refuge in real and not merely artistic illusions. Thus, to recur to the biological trope, the most highly specialized cells which have given up most of their original and general functions temporarily resume them and thus lay a broader basis for their special functions, recharged from the primeval source of energy, and are "regenerated" in the biological sense.

Mansoul contains a menagerie of primal basal traits, residues of our phyletic history. These slowly accumulate energy which sooner or later demands vent, wherein expression breaks through repressions, inner and outer, perhaps with eruptive force. Such phenomena are reversionary, when the phyletic rudimentary organs of the psyche long disused have their innings and sweep away the proprieties and conventionalities, and sometimes the virtues and even sanities, of contemporary civilization. Every state of culture has and must tolerate forms of license for these primitive propensities, and such institutions make for the safety of society, uncouth and barbaric though they often are. Great statesmen have sometimes apprehended this necessity but only inadequately, and only genetic psychology can fully explain it. The history of all, or April Fool's Day, *e. g.*, shows a tacit license for the young and the submerged classes to get back at elders, authorities, the rich or the aristocrats, by petty pranks and coarse jokes that trip up pride, position and dignity, and often humiliate and insult without stint. Little and perhaps great spites are sometimes vented in low, cunning, covert and sometimes anonymous ways. The victim may well and indeed must laugh it all off because the indignity he suffers may vicariate for graver injuries which would be inflicted on him but for this safety valve. To take as a joke what is meant to hurt and perhaps does, to appreciate ingenuity in the mode of attack, or to feign to do so, of itself abates malignity, while to have shot at an enemy with a blank cartridge that may singe relieves the ill-wisher, the desire to use a bullet is aborted, and so tension is relieved, and the object of hate is safer. So in the coarse carousals of the ancient Saturnalia, Mardi Gras and St. Valentine's Day when plebs may affront patricians and all may do all to all, the old war of all against all is fought over with padded weapons in a free-and-open, give-and-take way; and animosities and rancors, even slight and unconscious ones, are mitigated, and a more friendly feeling and perhaps good fellowship supervene. All this, of course, is only one element in these festivals. Today all are equal, and therefore tomorrow the old inequalities are on a more stable basis. Twice I have participated in Corso fêtes, and whoever has done so must realize that to pelt and be pelted with confetti and ribbons, to tousle and be tousled in mimic fights, leaves a kindlier feeling toward both friends and enemies. The point of points is that nothing whatever must be taken seriously. We must laugh at what would perhaps ordinarily make us wince or even weep. Every instinct of resentment must be in abeyance. There must be no pain but only pleasure. Good nature and jollity must be supreme. Anger and hate are undergoing purgation on the principle of the Aristotelian catharsis. We may fight hard but it is all in play, and he who "gets mad" should get out of the game and go home to cool off alone. Three of the old humors, the black and yellow bile and the phlegm, are discharged without scathe to others and with weal to self.

Personal encounter in sport is thus an element of psychic as well as physical hygiene, and all persons should find or make a plan for it in their regimen. It keeps human metal in temper, for most of us at times spoil more or less for a fight, and we had best have it all out in the pleasure field. Thus, we can help ourselves on to the standpoint of regarding many if not most causes of actual belligerency as matters of mirth and can laugh or play them off. This habit will also make our causes of real battle not only more just but make us more effective and formidable in them, and this is a point of great weight. We enjoy mimic struggle all the more as we realize how grave the reality of it would be, and this tends to keep us from turning sour. This the soul in its innermost depths realizes to the full, for the chief charm of nagging, hectoring and bantering is to both test the temper point and depress it, and he who can bear most, always of course within certain very wide limits, without taking offence is the one who wins the appellation of good fellow, which is the masses' supreme token of approval.

In logic there are sixty-four moods or combinations of the A, E, I, O forms of proposition, but only six in each of the four figures are valid; that is, there are more fallacious than legitimate combinations. Common sense, reason and sanity admit a far less number of association and thought processes than are logically possible, and the ranges of the sportive are far wider than those of serious ones. It follows that if a philosophy of wit, humor, etc., be possible at all, which may be doubted, it must be larger and more comprehensive and can come only after we have a science of sound, sober and permissible thinking. Thus it is not surprising that aesthetics has yet few if any final canons, and that it cannot explain or even classify all the ways in which the intellect disports itself. It is certain they cannot be elucidated in logical terms, for they are a-, extra-, if not anti-logical. To explain many of the most characteristic things of children and of wits by logical formulation is still sometimes attempted. In many aesthetic treatises, pages are devoted to explanations of all the connotations of a single jest or repartee. Up to date, almost every original *jeu d'esprit* is in a class by itself, or if it have offspring and relatives they make a group by themselves. Soundness of intellectual processes is like a small civilized oasis in the midst of an unreclaimed and varied wonder-jungle-land, where vestiges of about everything that ever was are found, and where novelties of many forms are ever springing into existence. Jokeland teems with drolls and freaks, monsters and fairies, that belong to none of the known text-book species. This land of folly has been visited and traveled by many, but mapped and its content ordered and scientifically described by none. Specimen products are found everywhere, but no one knows their pedigree, their embryology, or indeed much about their affinities. Although this land teems with forms that are new, there are also many that are older than civilization; and, what is more significant, they are offspring of psychic types of activity that are as ancient as man himself, for many things we laugh at are primitive and outgrown fashions of mentation that were solemn enough in their day. Thus, we have now a limited number of all the possible combinations of neurons and dendrites that are voted legitimate, that are selected out of masses of those that have been tried but proved unfit. Hence we see, too, that other types of rationality than ours are easily conceivable, not to speak of other types of sanity, propriety and all the rest, save perhaps virtue alone. Aviation and the telegraph would have been as much a side-splitting joke to the Ancient Greeks as ice is to the tropical savage, and so some parts of the domain of Puck and Momus may sometime be reclaimed.

We must here sit at the feet of childhood as commentators and preachers draw from each Scripture text. My petty collection consists of only a few random samples from the great book of childhood that ought to be scientifically and laboriously compiled from and for children as well as for us oldsters. Here is a rich educational mine not yet opened. In the presence of such a collection the world would grow happier if not more hopeful. Here is a paradise we have fallen from and ought to regain. If here and in the samples that follow I have merely grouped superficially rather than analyzed each specimen, it is in the hope that even this modest anthology may help to bring this large chapter of our aesthetics back from its present vague and stale generalizations to a more concrete basis. Only when the best and truest children's sayings are gathered and jests and wit adequately inventoried, dissected and labeled, can we have more scientific laws of classification; and only then shall we realize how much more light and delight come from free spontaneous than from constrained mental activities, and learn how to let up some of the repressions that we constantly and unconsciously exercise upon the young.

From several thousand *facetiae* collected for and by me during the last ten years, which I have grouped in many ways, trying, but unsatisfactorily, to find a natural classification, I select a few typical specimens and find that many of them are abortions of trial-and-error methods of seeking to understand life. I begin these samples with selections from a large collection of funny things said by or appreciated by children because wit, though it by no means originated with them, is very often only a reversion to childish states of mind.

Soda water is sweetened wind; it tastes like your foot asleep. A museum is a dead circus. Trees have trunks to keep their summer clothes in. Do I know as much as I don't know? Medicine is bitter so we will be careful not to get sick next time. A sprinkler on a wagon is to keep boys from riding behind. Soap tastes worst when it gets into your eyes. I stepped on my tongue hard with my teeth. People laugh in their sleeve because their funny bone is there. If I exercise the calves of my legs, will they become cows when I grow up? Boys are nouns, but when they run they are verbs. Switching a whip makes the horse go, so why don't you whip us that way? Is not a wheelbarrow the effect before the cause? You want me to be clean and cold, but I want to be warm and dirty. Waking up in a hail storm, a little boy asked if he had slept all summer. Grass is the earth's whiskers. Little calves give condensed milk. My school is not a board school but is brick. If *f* means forte, *ff* means eighty. Are sausages caught like fish? Ripping up a doll's dress on Sunday is excused as not working but unworking. Seeing sawdust come out of her doll, a small girl said, "You need not chew your food so fine as that." When the temperature drops as low as it can, we have cold feet. I saw where they made horses, for they were just nailing on the last shoe. How long after they bury a person does the gravestone come up? Sneezing while saying her prayers—"Excuse me, Lord." Tell us all about Mrs. God. If God doesn't love me Satan does, and that is some comfort. Johnny's cut-off leg is in heaven waiting for him. Seeing a picture of martyrs thrown to lions—"That little lion behind won't get any." Having been told how God took Eve from Adam's side, later in green-apple time he had a pain in his stomach and said he was afraid he was going to have a wife. I have been helping God; I almost blossomed a flower for

Him. Seeing dust blown up in the street, he said, "Come and see. God is going to make another little boy." I am not made of dust or I would melt to mud in the bath. There are no more floods because God knows most of us could swim now; especially the wickedest boys would not drown. No Santa Claus!—Oh, dear, how do I know that God won't bust up next? God might have given me a better nose, for he must know how particular I am. If you die, where will we get another Sybil? I guess God kept a pattern. Sunday is God's day, and Tuesday afternoon is mama's. Roosevelt's youngest child is said to have prayed God to care for mama and each of the children, but now to take special care of himself "because papa is not feeling very well just now" (and he might have new duties thrown upon him). The child struck his hatchet into the ground, hit a stone and made sparks and shouted, "I hit the devil on the head." "Did God make that ugly woman?" "Yes." "I suppose then he thought she was pretty." "You pout so I could sit on your lip." "Then I'd laugh and you'd fall off." A child seeing a rainbow said, "That is God's necktie." I play Sunday because then I play I am a little Jew. "Mama, I dreamed I swallowed myself. Did I?" How early does it get late? I am so glad to go home that I am glad I went. Cats are noisy because they are full of fiddle strings. When your tooth aches, you get it filled; my stomach aches—can't I have some ice cream? If your feet get near the fire, won't it pop your corns? Iritis seems to mean eye-wrong-is. Does Amen mean shut up? A boy prayed for a little brother. When twins came, he thought it lucky that he had prayed but twice, or there might have been three of them. "Which of the twins are you?" "I am the one you see before you." Hearing that someone had found the Lord, he asked, "Was the Lord lost?" A guinea hen is a chicken winding itself up. I like going to school, but not staying. I never read the thirty-nine Articles, but I did better and read The Forty Thieves. A widower married an elderly wife and introduced her to his child as a new mama. The child said "Papa, they fooled you. She isn't new at all." If you can't get the doll's head off, why not take the body off?

"It is raining," said the boy. "Let it rain," said the father. "I was going to," he replied. "Have you been good?" "Just comfortable." "What did your papa say when his pipe broke?" "Shall I leave out the bad words?" "Yes." "Then he did not say anything I can tell." "Is a thing lost if we know where it is, Mama?" "No, my child." "I am so glad, for I have just dropped your silver mug overboard." The concert lady stood up and screamed and gargled (trilled) and a waiter pounded the piano. I am seasick for home. Will too much water drinking make me water-tight? "Aren't you very cold?" "I was, miss, before you passed." Faith is believing what you know is a lie. "She bangs her hair." "Is that why she has headache so much?" Etc. is a sign to make believe you know more than you do. He who never had toothache does not know how nice it is not to have it.

Such things shed light upon the rich rank stage of psychogenesis in which the best metaphors and tropes of our speech were made, and when literal was transformed into figurative language and blossomed out into symbolic meanings. Only genius, which is ideal youth conserved, can imitate it, and spurious attempts are usually readily detected. Some made by grown-ups might have been made by children and so are germane. The laugh at them by elders must be of delight and wonder and not of derision.

The errors children commit while being broken into school work are another rich acreage of amusement to adults. Here I have a great and varied collection which might be subgrouped by topics in the curriculum and graded by age. Here, again, we realize that there are countless wrong ways and only one right one. A number of teachers have for years gathered and have sent me choice blunders of their children in recitation and examination, and as college and university dons find them. This theme is more complex but just as legitimate for psychoanalytic and genetic work as lapses in speech and writing now being so brilliantly exploited by psychologists and clinicians. I content myself here with only enough samples to indicate the genus. They serve at least to show how very unnatural and arbitrary the school topics first seem to be to the natural child.

A sentence containing bliss is—I have a blister on my toe. Coolies live in cold countries. Tattooed savages have their clothes etched on them. Posterior is Latin for bacteria. The equator is a menagerie lion (imaginary line) running round the world between two poles. The Iliad was not written by Homer but by another man of the same name. The feminine of Hero is Shero, of apostle is epistle, of Adam is madam. A synonym is a word you use in the place of another you don't know how to spell or pronounce. Ireland is full of bugs and molasses (bogs and morasses). If B. C. means before before Christ, B. A. must mean before Adam. Esau was a man in Greece who wrote parallels about the fox and the stalk and sold his birthmark for a mess of potash. The Mormons fertilize by interrogation (irrigation). When I am on my feet, I am nine; when I am on my head, six. Gastric juice is to keep the bones from squeaking. Nap is a little sleep; kin, of the same family; so napkin means a sleepy family. Trans means across, so transparent is a cross parent. He belongs to the epileptic school of doctors (eclectic or electric). The place was named Küssnicht because of Tell. A circle is a straight curved line with a large hole in the center. Gross darkness is 144 times darker than common darkness. A fort is to put men in and a fortress to put women in. "In which of his battles was Gustavus Adolphus killed?" "I think it was his last one." Gravity was discovered by Isaac Walton and is chiefly seen in September when apples fall. "What distinguished foreigner assisted the Americans in the Revolution?" "God." The feminine of cantatrice is cockatrice; of Ignatius is pugnacious. Sick is compared: sick, worse, dead. She was told to sit there for the present, but the present did not come. To Alice in Wonderland the cat vanished gradually, beginning with the tail, until only the grin was left. A mother, trying to explain spirit to her son, said it was perceived but not seen. "Oh, I understand," said the boy. "It's a skunk." Graduated sugar (granulated). I understand Wagner's music really is much better than it sounds. The rest of the pudding now, please, for you say, "Never put off till tomorrow what you can do today." The fruit of electric plants is currents. He was interested in poltices (politics). The monument was over the leavings (remains) of General Grant. He sleeps in Beelzebub's bosom. A barbarian cuts your hair. The consecrated cross-eyed bear (cross I bear). Why do they sing the dogs' holiday last in the church? Cannibal was the name of two brothers who killed each other in the Bible. Preserved seats at the theater. Where are magnets found? In the cheese. Lukewarm water looks warm but isn't. A child prays, "I hardly think we have any father" (I heartily thank thee, heavenly father). "It said burying-ground," said the child, "but I have been all over it and cannot find any berries." A tangent: a gentleman that runs a tan-yard. The bowels are five in number: a, e, i, o and u. A noun is an organ grinder, a person plays a thing (a person, place or thing). A Harvard examination paper under Dean Briggs said, "Dante stood with one foot solidly planted on the Middle Ages, while with the other he waved a greeting to the rising sun of the Renaissance." The crocodile lives in swamps and is ambitious (amphibious). Parables: lines passing around the globe from east to west. *Arma virumque cano:* arms, man and a dog. The natural bride is in vinegar (the Natural Bridge is in Virginia). A propaganda equals a brother of a proper goose. Livingston is the source of the Nile and was discovered by Stanley. Heat expands and cold contracts; that's why in summer vacation lasts seven and in winter two weeks. "I wish history would repeat itself to me at examination." The wife of a duke is a ducky. The nose inhales odious (odorous) particles. Mediterraneans: lines passing around the earth through the poles. Veterans do horses. I want to be the thermometer (monitor) of the class.[1]

These illustrate for the most part only verbal errors. Children's sense of the comic seems to parallel, in the main, that of undeveloped man. They love practical jokes, laugh at deformities and unusual things and acts; and only by degrees, and not before adolescence, do they reach an appreciation like the adult's.

Punning is often low and easily becomes a nuisance but is elemental and of great psychological interest. No language has so many words of different meaning and often spelling and etymology that sound alike as English, especially in America where shades of pronunciation are apt to be ignored. Thus, to suggest one meaning and then snatch the mind to another and perhaps to a third is a very easy and endless source of mirth. This is done best with the affected naïveté of the child or foreigner and also to their bewilderment and possibly, to some extent, to their edification, as witness several comic primers. If every word with a distinct meaning had also its distinct sound all this would be impossible. Hence, the size of the field open to the punster is a measure of the defects of our tongue and is augmented by its absence of inflections, also by many words of foreign origin sounding like those of Anglo-Saxon derivation. Puns play upon phonic semblances and suggest exaggerated ear-mindedness and arrested development, and take us back and down the scale of psychic evolution. They are often, to be sure, vehicles of wit, but more often, especially if strained, provoke disgust, particularly when we laugh with pity or even want to do violence to the perpetrators of vile puns. The lowest wag feels that he has humiliated our intelligence unless we can frown him down, and if we have to smile we are vexed with ourselves as well as with him. If he really thinks his performance funny we vote him the prince of all boredom and would "take him out on a chip" as about the most unsavory of all companions, for he affronts wit itself. If to banality and to labored effort is added staleness, our resentment may rise to a high pitch and we want to hiss, hit, or throw rotten eggs. Add to this indecency, and we almost feel murder in our hearts. Such a man is an enemy of all that culture stands for and tries to lead us captive back to the realm of chaos and old night. Tastes vary, but the following to our mind may serve to illustrate the worst.

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[1] Buren: "Children's Answers, Shrewd, Witty, Nonsensical and Pathetic." London, 1905, pp. 267. McNamara: "School-room Humor." London, 1905, pp. 130. H. W. Brown: "Thoughts and Reasonings of Children." *Ped. Sem.*, Vol. 2, p. 358. J. M. Moore: "The Kaleidoscopic Mind of Childhood." Liverpool, 1904.

Found, a new asteroid. Faith, I would rather find a new hoss to roide. To get rid of a dog, put turpentine on his tail and he will varnish (vanish). If a man ate his mother-in-law he would be a gladiator (glad I ate her). Chicks who found an orange in their nest said, "Oh, see the orange mama laid" (marmalade). Chicks do not go to heaven because they have their necks twirled (next world) in this. A cannibal queen trims her nails every seventh year, which suggests the Odd Fellows paraphernalia (pare off her nail year). Freightmen on the top of cars are never struck by lightning because they are nonconductors. Cats are like unskillful surgeons because they mutilate (mew till late). A young man's arm is like the Gospel, for it makes glad the waste (waist) places. The French hated Wagner's Lohengrin because of Elsa's (Elsass). A negro preacher shouted the name of God because the Bible said hollered (hallowed) be thy name. How did our first parents get out of Paradise? Snaked out. What did they do when they got out? Raised Cain before they got Abel (able). Adam and Eve stopped gambling because their paradise (pair of dice) was taken away. Adam was made just before Eve. Angels were placed at the gate of Eden to keep out the damn pair (damp air). The hardest tax to raise is carpet tacks. All our presidents in a row would reach from Washington to Cleveland. Policeman's clubs are now made of wrapping paper. The Yankee dude'll do. A sculptor makes faces and busts. The cat has a purr, the stove a damper (damn purr). A bicycle cannot stand alone because it is too tired (two tired). How does the cat like the new dog? Fur straight (first rate). A donkey is not stupid for he does much brayin' work (brain work). I am not one of the masses. No, but if I leave off the m, you will be included.

Such cases seem plainly to contradict Spencer's theory of descending incongruity as to expecting the great and finding a trivial meaning, for we often do this in such samples as the above and are not pleased but pained. They also do not at first sight seem to square with the psychogenetic theory that makes wit largely a reversion to primitive thought-forms and processes, for, although reversionary, instead of being agreeable they are the opposite. They are, however, admirable illustrations of another psychogenetic law that, although the reversion to really antique psychic states is pleasant and rejuvenating, the realization of those recently transcended is painful. We are most severe upon culture stages just cast off or left behind, as the most blatant atheist is the erstwhile believer. We were too recently in the stage when we could not laugh at such effusions. Our very sense of our growth and progress consists largely in feeling that we are now beyond all this, and there is a tang of self-pity that we did within our own memory fit it. That is why they now seem so dour. Our resentment is like that of *nouveaux riches* who hate to be reminded that they were themselves once bootblacks or washerwomen, although later the *juvabit meminisse* of it all may come to its own in their hearts. Thus, the impulse to maltreat vile punsters shows that we are not yet so secure in our new and higher standpoint as not to be ashamed to be reminded that we might yet relapse to feeling as we did as youngsters toward this stage of word-play.

Word-play greatly widens the range of the ludicrous, not only by itself being a source of mirth but also by explaining situations and by revealing the butt's state of mind. To children the mere sound of a new word is likely to be either amusing or impressive, and the same is true of adults to a considerable degree, especially to adults unaccustomed to look on words as tools. The sound often calls up other words of similar sound; that is, it starts up a tendency to rhyme and alliteration without regard to the sense of the words at all. Most children between three and six go through a period when they make strings of rhymed words, meaningful and meaningless run in together indiscriminately. Sometimes, too, they make simple verses, often suggested by the ideas associated with the automatically rhymed words. All this is very enjoyable and is often accompanied by laughter. We might perhaps carry the process back a stage farther to the lalling baby who repeats over and over the same sounds, but who also unintentionally and involuntarily makes all sorts of new and difficult combinations with the greatest enjoyment. And we should also note that older children and even adults enjoy practising such things as "Peter Piper picked a peck of pickled peppers." In all this sound-play we get something closely analogous to tickling. First, we ourselves do not foresee how the speech-organs will react when started off nor how the reactions will make us feel, and so we listen for the result with curiosity and enjoy the slight shock of surprise. Secondly, if the accidental combination makes sense we get another surprise at our own cleverness and are more likely to laugh than in the first case; while, thirdly, if we suddenly discover two meanings we get a still deeper enjoyment. For instance, I have just been playing with sounds thus: ma, may, mi, me, mu. This naturally suggests, Ma may miss me much, at which I smile. But then I decide to make a pun, and look over the sentence for words with a double meaning. May strikes my attention first, and I say, May may miss me much. But this is old and obvious and I try to get a complete sentence of mays, without success. May may miss me much in May is the best I can do. I change it so as to bring all the mays together—In May May may miss me much, and as I write it down I realize that miss will also have a double meaning if written with a capital. Then I realize that I have just laughed. But, after all, this is not so very funny, because it does not fit into any actual situation as some puns do. One of the most satisfying illustrations of this sort is the answer made by the brakeman to the lady who asked how long the train stopped at a certain station. "Too-too-too-too-too-too," he replied. (Two to two to two two.) The answer was scientifically accurate, it consisted of just one word in varying meanings, and it imitated the characteristic sound of the train, so that for a first indignant instant the lady may have thought he was deriding her and then awakened to the fact that in truth he was flattering her by using the same terms as he would to a railroad man.

The best puns, that is, come out in the snap and flash of repartee and are truly witty. They often emphasize serious truths by summing up profound likenesses and differences in one word or phrase. When, on the signing of the Declaration of Independence one signer said nervously, "Gentlemen, we must all hang together," and Franklin responded, "Yes, or we shall all hang separately," the descending contrast between themselves leading a united country to freedom as statesmen and warriors and dangling in the nooses as traitors was surely shocking enough, and probably they laughed when they realized that the full nooses would be the inevitable result of their failure to be united and the fitting punishment of their selfishness and sectionalism, that they would really be traitors deserving death, even as their enemies asserted, but in a totally different sense. There may also have been the sense that by signing they had overtly committed themselves irrevocably to "hanging together," and had thus won the great victory over their own doubts. Serious as the signing was it was still an occasion when tensions were released, inhibitions let down, and in the various ones present doubtless all the degrees of relaxation could be observed, from the sigh to the laugh.

That is, in a pun two meanings are hidden in one word-sound, and in proportion as they are contrasted and express truths the pun passes over into wit or wisdom. The pun combines two pleasures. As we have already seen, the delight in mere sound-play persists from childhood, and when we get it with a minimum of meaning or appropriateness we have the low forms of the pun such as children and grown persons unused to handling words enjoy. The emphasis is on the similarity of sound and little attention is paid to sense.

When, however, a new set of ideas is roused by this same sound the sudden appearance of difference is surprising and almost miraculous.

Hughlings Jackson makes two interesting comparisons. The analysis of puns is a good way to begin the study of normal and abnormal mentation, for:

(1) Vision is stereoscopic and slightly diplopic, since there are always two dissimilar images to one object. Mentation is also stereoscopic and diplopic, *i. e.*, with double consciousness, and its process is always tracing relations of likeness or unlikeness. Now, its caricature or play is the pretense of resemblance and is in these chief stages—puns, wit, humor.

(2) Jocosity thus implies some surplus mind, and it appeared in the race with play and the aesthetic sense. We can thus reason back from its appearance or not, that the man who lacks it will also lack the best scientific conceptions and perceptions of true reality (one might add also, I should think, artistic sense in all forms). Again, there is a close resemblance in insanity and morbidity to the mechanism of jocosity and a similar caricaturing of the normal process.

Word-play can be not only decent but enlivening, as witness Saxe, Hood, Lamb, etc. We have to be mildly stunned and bewildered. At the very least, this teaches us the sinuosities of our mother tongue and enables us to look down upon foreigners and children who are striving to master it.

Descendants should not descend too far. His kindness is unremitting; he sends his family nothing. When a minister resigned his parish was quite resigned. It is ten to one if you catch the twelve-fifty train. This is the woman's exchange but they do not really exchange them. Flirtation is attention without intention. *Eifer-*

sucht ist eine Leidenschaft die mit Eifer sucht was Leiden schaft. Our hotel has fire escapes; the heat escaped from my room in the night and I nearly froze. They call that horse Regulator because all others go by him. What will you talk about? About twenty minutes. I am first at last; I was always behind before. Can you eat a square meal at a round table? At our farm, we eat all we can and what we can't, we can. What would you do with a quarter of a million (quart of vermilion)? Paint the town red? Heine said he talked to Rothschild familionnairely. Let us fly said the flea, let us flee said the fly; so they flew through a flaw in the flue. Beecher's epitaph of Bob Ingersoll was, "Robert Burns." Pasteurized milk is good for babies, but pasturized cows are better. Births, marriages and deaths one editor headed hatched, matched and dispatched. Our government now hardly allows the Indian even a mental reservation. She heard the lecture on sun spots, thinking to get a cure for freckles. The kind of dress little Egypt had on was knit. A Zulu belle is like a prophet, for she has little on her (honor) in her own country. The light fantastic tow (toe) is very blond hair. A made-up woman is like a fall in the mud, for the first is a sham dame and the other is a damn shame. The difference between a wool dyer and a lawyer is that one is a lamb dyer and the other is a damn liar. The difference between a tube and a drunken Dutchman is that one is a hollow cylinder and the other a silly Hollander. Beware the dog—Ware be the dog? The soldier faces the powder, the lady powders her face. A corrupt official is unlike a church bell, for one steals from the people and the other peals from the steeple. Sprinting for trains is good training for sprints. The difference between an auction and sea-sickness is that one is a sale of effects and the other the effects of a sail.

The difference between hitting a man and killing a pig: one is 'saulted with intent to kill, the other killed with intent to salt. Between temptation and infinity: One is the wile of the devil, the other a devil of a while. Between opium and Abraham: one is the juice of the poppy and the other the poppy of the Jews. Between the Czar of Russia and a barefooted boy: one issues manifestoes and the other manifests his toes without his shoes. Between an ordinary and an extraordinary professor in Germany: The ordinarius never does anything extraordinary and the extraordinarius never does anything *ordentlich.* Between a prairie and a toy demon: One is a dead level and the other is a lead devil. I traveled with the lady *tête à bête.* Mr. Biggar had a son, a little Biggar. Oh, *luce uri is reddas minis,* and *minis reddas a dux nos. Gymnasticus pax his nos mittis tum an fingar.* If a lawyer should only charge a nominal fee it would be phenomenal. Marriage is not a failure, Ikey; but if you marry a rich girl it is almost as good. Your Honor, when this crime was done he was rocking the cradle and we will prove a lullabye (alibi). Once my hair was curly and my form straight; now my hair is gone and my form is curly. "Did you see Smith's astral body at the seance?" "No, only his jackastral body." Is it an incubus or a pen and incubus? The first daughter was named Kate, the second Duplicate, the third Triplicate and the fourth Syndicate. The crazy Bavarian King Leopold was so much under the influence of a lady named Cleo that he was called Cleopold. If you dam a river you boom it; if you boom a town you damn it. A boy went to college to be a minister, but turned out a horse trader and thereby brought far more souls to repentance. It is bad to know so much that is not so. A dissipated man returned after years of travel with a wedding ring. "Are you really married?" he was asked, and he replied, "*Trauring* (*traurig*) *aber wahr.*" He has a great future behind him. The coming of the crow's foot is the going of the beau's foot. A Papal bull you must believe or be excommunicated, but an Irish bull you may believe or not. The quick and the dead: the quick gets out of the way of the auto; but if he does not, he is dead. No aspiration is realized without perspiration. "In one thing all women are alike," said Mike—"in being different." Some do not go through college; it goes through them. One of Napoloen's first acts was to rob the Duke of Orleans. *C'est le premier vol de l'aigle.* Woman poses, God disposes, man proposes. The best color to keep a secret in? Inviolate. He is so deceitful he would pat you on the back before your face and hit you in the eye behind your back. At a ball game a boy was struck in the back of the neck, and the ball (bawl) came out of his mouth. A colored doctor said the only two things he needed to understand were laudame and calumy. It may be it is and it may be it is not and may be it is both, but I doubt it. Why do the Russians rush, the Teutons toot, the Anglo-Saxons angle, the Yankees yank, the Paddies paddle, the Hebrews brew, the Scotch scoot, and why are the French so fresh? We see all about us the footprints of an unseen hand. After his first wedding a bashful clergyman asked, "Is it cistomary to kuss the bride?" In the house of a widow who married a widower there was a great noise which she said was "my children and your children licking our children." "Why was the death of John Rogers better than that of Charles the First?" "A hot stake (steak) is better than a cold chop." By careless proofreading a morning journal described the speaker of the evening before as a battle-scared hero. He protested that he had never been frightened in any wars. Next day the paper apologized, saying that all would understand that it should have been bottle-scarred. When Lord Coleridge was in Baltimore the hotel boy was directed, when he was called, to rap at the door and in answer to the inmate's "Who's there?" say, "The boy, my lord." The boy was confused and said instead, "The lord, my boy." An Irishman took the boy's place and was directed when he was summoned to rap on the door and say, "What is it, my lord?" He said, "My God, what do you want?" To buss is to kiss; rebus, kiss again; buskin, kiss a cousin; blunderbuss, kiss the wrong one; omnibus, kiss all in the room.

Laughter at obscenity and the breaking of sex regulations is one of the most puzzling things to explain, but a large part of it surely comes from this reduction of a superior to the common level. In proportion as a man claims respect and honor from others he tends to cover up his physical needs. "No man can be a hero to his valet." This is especially true of those who deal professionally with the soul, our incorporeal part; and so there is a peculiar piquancy in discovering that priest and saint have the same passions as they condemn in the sinner. So, too, woman has always assumed to be modest and indifferent and has made man beg for her favors. How amusing to him, then, suddenly to discover that she is fully as desirous as he and will seek him even as he did her. Much obscenity and blasphemy consist in bringing us violently face to face with the fact that even the most exalted and holy personages are subject to the same physical passions as the lowest slave or even as animals.

There are today and always have been people so abnormally sex-minded that everything straight suggests male and everything curved or hollow female. Phallic religions that some think once covered the earth, the prevalence of gender of about all nouns in most languages save English where this is vestigial, the collections of pure smut published by anthropologists, and finally the Freudians who see sex in all psychoses and nearly all neuroses and make its symbolization the key to wit, illustrate this.[2] Doubtless all these views are exaggerations of what is partially true. Sex is more and more veiled and sublimated as civilization advances, but yet there is a vast body of obscenities current among boys and men, some of which is pure vileness, but which evokes the coarsest of all laughter and is loathsome and corrupting. This is about the only theme in which mere grossness with no flavor of wit or humor provokes the guffaws of brutal men. Be only shameless and indecent, and the groundlings applaud. It is just this tendency that keeps alive a vast body of filth that both law and decency strive in vain to suppress. No condemnation can be too severe for those who vulgarize the sublime and sacred facts and truths of sex. On the other hand, there is a body of really brilliant things that have happened and been said in this field which, although a bit risqué, true gentlemen may and actually do enjoy when they are together, whether they should do so or not; and some of this is, after careful expurgation, too good to be lost, and for it there should perhaps be occasional times and places. Were our modesty so prim as to banish everything essentially comic here because it contained faint innuendoes of the forbidden, the domain of wit would be materially narrowed. Moreover, who shall say that men do not, especially the mature and aging, find here a vicarious vent and function that discharges tensions that might otherwise become more sarcous and scortatory? Real wit may have some license, then, in this delicate realm if it has some genuine disinfecting power. It must be very brilliant indeed to justify any degree of rankness but it does have some rights, like art, for its own sake even here. At any rate, theory and pretence, if not actually hypocritical, are in about all men at great variance with practice here. If this seem dangerous doctrine it is because only very acute psychological analysis can distinguish how many ingredients of filth and how many of pure wit and humor are contained in a given concoction. Another trouble is that wit has rarely ranged itself on the side of purity and against vileness, but its lesson is one of rather easy toleration. It is probably more likely to be alluring than satirical or castigating, more enticing than censorious. One of the worst results of too much acquaintance with most current drolleries of this kind is that they can hardly fail to interfere with the idealization of woman, who is too often represented as sensuous and full of secret duplicities and anything but true and pure. Vile things here once heard tend to be perpetuated in memory like almost nothing else. Clever moral tales and *bons mots* generally are forgotten, but not lascivious ones. For these infections human nature seems to furnish no antitoxin. The hearing of a ribald thing is liable to maculate the virginal purity of the mind forever. Each age, nation and social stratum has its lines pretty exactly drawn between the forbidden and the permissible, and near these the tension both ways toward more strictness and more laxity is greatest.

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[2] Freud: "Der Witz und seine Beziehung zum Unbewussten." Leipzig, Deuticke, 1905. 205 p. See also my "Educational Problems." N. Y., Appleton & Co., 1911. Vol. 1, p. 392 *et seq.*

Why do we tend to laugh at what offends modesty? Freud answers that improper things were originally said in the presence of women as expressions of man's instinctive tendency to encroach upon her reserves and reluctance. Transgression of conventional lines between the licit and the nonlicit, he says, is a form of man's instinctive aggressiveness, of the first stages of his attack upon female virtue, and may moreover act aphrodisiacally upon her desires. It stands for the first lesson in the arts of seduction. It is the first step toward undermining the outer fortifications, and it may end in the capture of the citadel. This is an ingenious and more or less plausible genetic theory, but we can hardly accept it as more than partial, for why do men take such delight in these things when alone? Is this secondary and derivative, as he avers? This seems doubtful, for such converse both mildly stimulates and vicariates for real indulgence. It can be psychoanalytically only an attenuated form of mental masturbation, even though it can make but little headway. It adds to the store of sex images and perhaps proxy expressions, and increases, intensifies and widens the sphere of sex-mindedness. If this is, as most hold, already overdeveloped in modern civilized man, this tendency is predominantly corrupting. I append only a very few of the least unfit from a mass of all sorts, many of which it would be a crime to print.

There are all kinds of doctor specialists, some for the eye, some for the ear, lungs, throat, nose, etc., but none for the umbilicus. Yes there are; the naval doctors. A woman had an illegitimate child and excused herself because it was so small. "She raises her dress too high on the street." "Yes, a little above two feet." In a measles epidemic the children were daily questioned as to illness at home. A little girl stayed out one day and was asked if any one was ill. "Yes," she said; "we had a baby, but the doctor says it isn't catching if you are careful." A country girl going to the city heard the first night a lecture by Bob Ingersoll on religion, the second night one by Ignatius Donnelly on Shakespeare, and the third night one by Jeness-Miller on dress reform, and wrote home, "I have lost my God, my Shakespeare, and my underclothes." The city council discussed the proposition of putting a dozen gondolas on the lake in the common. One member arose and said with great dignity they must economize and there was no need of a dozen. "Get one male gondola and one female gondola and let nature do the rest." A man slipped up on an icy walk at the top of a hill and slid down, tripping up a fat woman from behind, who perforce sat upon him; and thus they slid to the bottom very swiftly. Both were confused and almost stunned, but he finally mustered consciousness to say, "Will you please rise, madam? This is as far as I go." O woman, in our hours of ease so silent, coy and hard to please, but seen too oft, familiar with thy face, we first endure, then pity and embrace. When a chair factory was burned in Holden some of the repair work was done in private houses, one of which hung out the sign, "Damaged boys' bottoms repaired." It was opposite the schoolhouse. Why is a nurse? Because Mumm's extra dry. A proper study of mankind is Venus Aphrodite. They watch her transit from club windows. The colored man went to a druggist for a cure for a vile disease and when the bill was presented asked: "Do you make a reduction to ministers of the gospel?" This is a girl like Dreyfus; the army does not believe in her innocence.

Wit seems to have trained its sharpest weapons on woman. Her form, dress, fashions, passions, caprices, and most of all the traits of those who remain unmarried have been made subjects of endless jokes of every quality of wit, ranging from mere dalliance and tantalizing to bitterness and rancor. Strangely enough, woman has not retaliated and shows hardly a trace of any desire to make man ridiculous in return. The feminist should look into this, for by general consent her tongue can be as sharp as man's. She will admit and man will not dispute that he is intrinsically no whit less absurd. Her subjection cannot cease until she has righted this inequality. The old bachelor is quite as, if not more, preposterous than the old maid; and the woman-hater is as bad as the man-hater, while the woman impersonator of man is perhaps almost as successful as the man impersonator of woman. If a woman be mother, especially if she be nursing, she has always, to the great credit of mankind, been almost absolutely exempt from wit; but the farther she stands from this maternal function the more exposed she has always been to the barbs of comedy and even of satire. Amidst the war of sex against sex this has its lesson, which is that maternity is the holiest of all holy offices. Love itself is sometimes derided but maternity never. Perhaps nothing else in the world is so immune.

No woman ever got cold if she felt herself well dressed. An Italian maid stilletoes her false lover. A Spanish maid gets her bravo to kill him. A German girl sheds copious tears and writes poems. The French girl if jilted tosses her head and says there are as good fish in the sea as were ever caught, and sets her cap for another beau. The American girl sues for heavy damages for breach of promise. There's a gladness in a woman when she's glad; there's a sadness in a woman when she's sad, but the gladness and the sadness are not in it for a minute with the madness of a woman when she's mad. Man's first sleep became his last repose. For Eve was made out of the crookedest part and flirted with and cross-examined the serpent. She has traveled in Europe, and while not much of a linguist has learned to say "Yes" in seventeen different languages. The ideal fireman should be like an old maid, ever ready and never wanted. I popped the question, and I have the refusal of her.

Religion and all its institutions have from antiquity down been a theme of wit, biting where it was disliked and pleasant where it was favored. I know an old farmer who offered to bet he could tell two hundred "Minister stories." Those I heard usually made the clergy mildly ridiculous, and yet the old man always attended church and with deference. Just as sex jests may be really witty and yet very indecent, so those on the theme of piety may be witty though very sacrilegious. But as witticisms on sex tend very strongly to be simply nasty and witless, so those on religion tend to be simply blasphemous, although this latter tendency is vastly less developed, restrained as it is by its associations with death and the next world. What makes the skeptic laugh makes the devout shudder. Of the professions, doctors come next as butts of wit and lawyers third, for they are a little less close to the life of the folk, but a volume could be compiled of gibes of every quality against each.

The English excel all nations in taking the gospel to heathen lands. Soon the heathen have the gospel and the English the land. A prayer-meeting began by singing "What shall the harvest be" and ended by singing "Nothing but leaves." "Nearer my God to Thee" is played to a waltz tune. Since these Baptists began to wash off their dirty sins in my ponds my cattle have been poisoned. Taft said that the Christian Endeavorers did not succeed with the Filipinos because they did not wear clothes enough to pin a badge on. God may love all, but He doesn't admire all. A negro was converted because when drunk he saw angels and devils teetering on a gravestone. Said a fat convert wheezing up the aisle, "I weighs three hundred and seventy-eight pounds, and every pound is for Jesus." We call that fish a baptist because it spoils so soon after coming out of the water. A very pious bankrupt was almost starving but on opening his Bible found a twenty-dollar bill which he thanked God for and thought a direct response to his prayer. After spending it, it was found to be counterfeit, and he was arrested, and his faith was shaken. Why are young converts like bumblebees? Because they are biggest when first hatched. The title of a tract was "Go to hell, by the author of Come to Jesus." "I thought he was a Christian." "He is, but I guess he don't work much at it." "I will ask Bacon if he wrote Shakespeare the moment I get to Heaven." "What if he isn't there?" "Then you can ask him." A quarrelsome man had broken up church, Sunday school, etc., and one night at a prayer-meeting when he was absent the pastor prayed he might go to hell. When a committee remonstrated, the pastor explained that he wanted him to go there to break up the institution. After hearing a temperance lecture, an old man said there was only one mention of water in the Bible, where the man in hell begged for one drop. The Southern negroes sing about golden slippers and go barefoot. They sing "Give me Jesus and you take all the rest"; and the white man has taken them at their word. Each boy in the Sunday school must contribute a penny and at the same time say an appropriate verse. One chose, "He that giveth to the poor lendeth to the Lord." Another said, "The Lord loveth a cheerful giver." The third, "A fool and his money are soon parted." As Goliath fell he said, "Such a thing never entered my head before." The cock wept thrice, and Peter went out and crew bitterly. A man was refused entrance to Heaven by Peter, whereupon he imitated a cock-crow. Saying, "Say no more about it," Peter immediately let him in. A baker built in a tombstone as the basis of his oven, and all his bread has "resurgam." Survivors of a lost vessel in a boat desired to be religious; but they had no Bible, no one could pray, and so all they could do was to take up a collection. A peasant woman in hell asked Saint Peter to get her out, which he promised to do if she would tell one generous thing she ever did. She declared that she gave a carrot to a poor woman in a famine. Soon an opening appeared in the very zenith of heaven, and a carrot was let down to her. She grasped it and was slowly lifted out of the vast sea of hell fire. As she went up, others clung to her garments and still others to theirs, until it seemed as though there would be a general delivery of all the lost souls. As she was just on the threshold of heaven, the weight was so great that she feared she would lose her hold and so turned to those below and cried out, "This is my carrot." This egoism caused the support to break, and all fell back into hell forever because of the selfish word "my."

A recent convert who had been very profane began to testify to his experience in prayer-meeting by saying, "The Lord has done great things for my soul." "Please speak a little louder, brother," said a hearer. He repeated the sentence, when another still farther back and later yet another called upon him to speak louder. At last, being angry, he shouted the initial sentence at the top of his voice and called, "Damn it, did you hear that?"

In an intense drought in Chile the town council in solemn conclave voted, "Whereas, the Supreme Ruler of the universe has not been properly attending to his functions of late, that if it does not rain in one week all the churches shall be closed; if not in two weeks all priests shall be unfrocked; if not in three weeks they shall be shot; if not in four weeks all the churches shall be razed to the ground and a commission sent abroad in search of a better religion." It rained the next day.

The Presbyterians write their sermons. The Methodists do not because the devil would have time to suggest objections, whereas when the Methodist begins, the devil himself does not know what he will say.

A missionary talked vividly of hell fire as the devil's kingdom to the Eskimos, when the thermometer was forty degrees below zero. His hearers afterwards asked him for directions to the infernal region, where they wanted to go to get warm.

A clergyman had a donation party and a baby born the same week. A bet was on, which he would mention in his prayer. He thanked God for the heavenly succor (sucker). Which was it? A church had several students preach until they felt they had been calf-pastured long enough. The age of Queen Victoria showed the efficacy of the prayer "God Save the Queen." Negro preacher: "The Bible says, she heard Paul preach, grew sleepy, fell out of the window, broke to pieces, they picked up seven basketfuls, and all the five thousand did eat and were filled. Whose wife shall she be in the resurrection, for they all had her to eat?" A colored preacher: "There will be weeping and wailing and gnashing of teeth." "I ain't got any teeth." "De Lord will provide." A negro preacher's text was, "God gin us His only forgotten Son," and told how He was forgotten. A clergyman on a voyage strove to stop swearing among the seamen, but a terrible storm arose and, having heard that there was little danger as long as the sailors swore, peeped into the forecastle and returned, saying to his wife, "Thank God, they are swearing yet." Girard College excludes clergymen. A man wearing a white necktie was once stopped by the janitor. He swore violently at this functionary, who very politely stepped aside and said, "Walk right in, sir." A man went to hear Joseph Cook, thinking all the time it was Mark Twain. When asked if it was funny he replied slowly, "Yes, funny, but not so damn funny." "Yes, the Bible says teach the gospel to every critter, but it don't command every critter to preach it." "Our minister asked me if I ever played cards on Sunday, and I said 'Get thee behind me, Satan.' " A dignified New York clergyman brought his wife into a train in the subway and placed her in the front seat and stooped to kiss her goodbye before leaving himself. But the car started so suddenly that he kissed a pretty girl ten seats back.

The liberties taken with death are quaint and pathetic. The King of Terrors is rarely made a grim jester, as by Holbein, a skeleton grinning as he mows down people at the most inopportune moments, tripping them up into the grave in the midst of every revel. But all the accessories, coffins, corpses, shrouds, funeral service, burial, are spun over with grotesque jocularities. Man laughs at death with great glee and gusto while he can, as if to avenge himself in advance for the inevitable. Of all creatures, man alone knows he must die, and from a philosophical point of view death is the most ridiculous and absurd thing conceivable and one of the hardest to realize, even for our friends. Men have died with, in, and for a jest, although the laughter on this theme is nearly always a little hollow and affected. But why should it be? If we fully believed in eternal bliss to come the hour of our demise would be the jolliest of all, and we should welcome possibly even the most hideous form of death with a shout of joy and triumph, as did the early Christian martyrs. Perhaps we should do this too if we lived out our life to its physiological end and died naturally and with all our powers at once, with no mortuary pain or ceremony. It is more reasonable to laugh than to weep at it. Again, as with God and sex, the joker takes especial pleasure in the shock he inflicts and forces his laugh if others are silent. In fact, on this theme real wit is almost silent but humor leads and marshals countless drolleries about accidents to corpses, persistence of traits in life, reanimation and many ways in which poetic justice is done. Sometimes the buffoonery goes as far as decomposition and the dead burn with the alcohol they drank or are eaten by the woodchucks they have killed. Skull, bones, skin, etc., are used in fantastic ways. The soul, more subtle than brimstone fumes, has its own adventures and holds many a comic dialogue with Saint Peter, with Satan and spirits of the dead, sends messages, comes back itself in ghostly apparitions, perpetrates endless practical jokes, is reincarnated in human, animal and other forms. In the books on epitaphs[3] fun is often fast and furious and every trait of naïve and foolish fondness and falsehood is represented. No more quaint, curious and quintessential literature exists. If the gods or immortal souls laugh down on us from above, it must be at many of the *hic jacets* in which love, grief, pride, pity, truth and falsehood, and occasionally hate, are so mingled.

A widower put on his wife's tombstone: "The light of my life has gone out." Later he married again, and a wag added to the epitaph: "But I have struck another match."

Here lies Johnnie Cucopod, have mercy on his soul, O God; he would on yours if he were God, and you were Johnnie Cucopod.

Epitaph to a cowboy: He done his damndest; angels can do no more. This tombstone was raised to keep her down. Our Jimmy overate cherries and is now a cherubim. A piece of plaster fell onto the floor, and a German girl understood it to be a voice calling her dead brother, Max. A man erected a memorial window to his three wives on the principle of certain signs, so that to those who sat on the left of the church it was a tribute to Mary Smith, to those in the middle to Sarah Brown, to those at the right to Jane Williams. The head-line in a Western newspaper describing the hanging of a murderer converted at the last moment said, "Jerked to Jesus." A man's wife died, but as they joggled the coffin near the grave she came to. Later she really died, and the man followed the coffin closely, saying, "Gently! Gently!" The advertisement of an undertaker declared that he would be delighted to serve his customers. At an Irish laborer's funeral his friends contributed an elegant floral anchor which the wife mistook and asked in so loud a whisper that all could hear, "Who put that damned pick on Mike?"

Would a will made by Lazarus have been valid after he was raised? In 1700 in Dublin a criminal was hung for half an hour, but when his friends took him down and took the corpse away he revived. The friends were horrified, thought he was a ghost, and beat him to death. But they could not be tried because the victim, it was decided, was already dead by due process of law. A rich man made a long will at the end of which he commended his soul to God. The lawyer who strove to break it said he desired to speak with respect of the residuary legatee, but thought he had been treated very meanly.

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[3] "Epitaph": being a collection of 1300 British epitaphs. Lond., Gill, 1909. 496 pp.

Drunkenness in all its degrees and forms has given the world endless pleasure. Of all the vices, it is most mirth-provoking, both for the subject and for the beholder, despite all its disgusting traits. It has a wonderfully rich vocabulary descriptive of its states and aspects,[4] many of them witty and mirth-provoking of themselves. Drinking songs describe mild inebriation as the happiest of mortal states, the most effective quencher of all trouble, and "all the bonds of friendship tighten when they are wet." Most who drink do so to be happy and exhilarated and not for the gratification of taste, and a good part of the happiness consists in escaping the repressions of conventionality and letting out impulses usually held in check. There are people whose whole nature would be irrigated and who would be enlarged and enriched by a little of the fertilization of soul that can come from this source. If we ever have a psychology of temperance it should be truer to human nature and needs than the easy and extreme doctrine of total abstinence, which is only a therapy for sots. *Tutissimus in medio ibis.* An occasional touch of vinous rollickery that gives us a vacation from the prim proprieties touches the intellect with its own peculiar spur, makes the timid bold, the sad glad, the inert alert, opens those who are shut up, gives a sparkle to wit, a bouquet to humor that makes life itself here and there frothy with folly, adds to self-knowledge by showing us and others the deeper psychology of human nature with the lid off, and lifts the soul above the dull dead level of ordinary sobriety. By letting ourselves go within the limits of moderation and a certain not too rigid degree of control we learn what we are made of and also understand charity for others. It is all an individual question of kinds, degrees, means and occasions. A touch of bibulousness, then, restrained but not restraining, may gild our droning strenuous life and bring occasional joy unconfined, sweeten bitterness, make noise seem music, and save us from the dessication of slow, over-brooding melancholy.

"I pity the man who has never viewed the world save from the low plane of ordinary sobriety." A drunkard hated water because it tasted so strong of the sinners drowned in the flood. Drink shortens a man's days. Stop it and each day seems ninety hours long. "Well, stranger, you wouldn't ask me how to cure a cold if you lived in this state (Kentucky)."

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[4] "Studies in the Psychology of Alcohol." By George E. Partridge. *Am. Jour. of Psychology.* April, 1900, Vol. XI, No. 3, pp. 318-376. A few such designations are: a bit on, off, all key holes, all sails set, back teeth afloat, bended, blowing, breezy, canonized, chirping, clear, comfortable, cosy, edge on, electrified, elevated, exalted, four sheets to the wind, gilded, glorious, happy, head on, inspired, jug-steamed, leery, limber, loaded, lively, loose, mellow, miraculous, triumphant, on the end, overstocked, primed, pruned, pushed, salubrious, scammered, smoled, spiffed, sprung, stewed, stimulated, tired, twisted, yappy.

A man fell sick. His doctor commanded him to give up liquor. He got well; lived ten years; fell sick again; dropped smoking by command, and lived five years. And so on until at last, having no more sins to give up, the doctor told him he must prepare for death.

An old sot called on a doctor to sell his "ca'cass," when he was through with it, for twenty-five dollars down. He said it had been half preserved in spirits already, but the doctor beat him down, saying that he had ptosis, had lost his hair, teeth, broken several bones, and that his skeleton was doubtless brittle. He finally made the purchase for five dollars, with which the old man got so drunk that he died. An ancient maiden rode to a distant town in a freight wagon, sitting on a coffin box. A half drunken man whom they met frantically stopped the team, shouting, "Your corpse is out!" The friend of a colored cow doctor said that the doctor's medicine always drove out the disease but that the cow died of the medicine. Dr. K. had a broken jug in which he put remnants of all his drugs, and when any patient called whose disease he could not quite recognize, he gave them a dose of this mixture. A man received an unintelligible letter. An apothecary friend saw it and put it up as a prescription, thinking he had got it right.

The American type of mind, probably more than any other, enjoys pure exaggeration. This is undoubtedly bred in our atmosphere of freedom. Let every concept go as far as possible before the reductive in Taine's sense is allowed to check it. Some thing or person is so big or so small, fast, slow, hot, cold, or anything else that—is the formula; and then comes the absurd and extravagant characterization. This type of funniness, although we did not originate it, has been vastly more developed in this country than anywhere else. Europeans at first could not understand Mark Twain. They pitied the jumping frog who could not win because his stomach had been filled with shot, and saw nothing to laugh at and brought their critical faculties to bear on the literal impossibility of such waggeries, which, however, we have slowly taught them to appreciate.

It was so hot that an egg a boy dropped on the doorstep fried instantly. The wind blew his hair out and would have pulled his front teeth, had he not kept his mouth shut. He was so thin that he never knew whether he had stomach ache or back ache. He was so tall that his feet got cold and froze before his head knew it. The train went so fast that the telegraph poles looked like a fine-tooth comb. The Ganges water is so bad that microbes cannot live in it. She scrubbed the floor so hard that she fell through into the cellar. The soil is so poor they have to fertilize the graveyards to insure a resurrection. It is so muddy in Keokuk that when a man was about to kick a hat on the street the voice of the wearer called up, "Don't, my head is in it and I am standing on the top of an omnibus." A golf player swore at his errors and his wife induced him to put a pebble in his pocket at every oath. Late one holiday he toiled home, unloaded all his pockets of tiny stones, threw down two bags of them he had carried on his back. "These," he said, "are the darns; the damns are larger stones and are coming home on freight cars tomorrow." He was so black that when he entered the room at noon they had to light the gas. He made a trust of and owned all the canals on earth and got the option on those in Mars. It was so cold the words he spoke froze up to thaw out next summer when no one was around. The flock of pigeons made noon seem midnight, and people got lost and lit matches to see their watches. When aviation really arrives, they will have to legislate to keep open spaces like commons in the sky to save the city gas. The smoke was so dense they cut it into cubes for paving stones. She was so sour-faced that if she looked at an orchard the cider press could get nothing but vinegar from the apples that grew there. Her hair curled so tight she could not shut her mouth. Her teeth were so crooked she used them for cork-screws.

A man trained fish to live a minute, two, five, ten, etc., out of water to demonstrate evolution. Finally, he could carry it for hours and hours in his pocket and at last one day after it had become thoroughly acclimated to air it flopped out into the water and was drowned. A calf swallowed a new stem-winding watch and lived to grow up. When he was killed, the watch had not grown to a big one but had so stuck in the throat that the friction of swallowing had kept it wound up and it was still going. A farmer was so ashamed having voted the wrong ticket that the next summer he sheared his sheep beginning with the tails instead of the head because he could not look them in the face. A fat man was stuck in a small place in a cave where they at last left him to die. He then thought of how he had once voted the wrong ticket, and he felt and became so small that he crept out easily. He smoked a pipe the bowl of which was so big he fell into it and was burned to a cinder. R. no longer wants the earth since he has learned that it is the smallest of the planets. A Chicago man dried snow and sold it for salt. A painter painted a cork that looked so much like marble that it sunk in water like stone. "I feel like the wandering bung-hole of an uncreated barrel." A man, stopping in a Western hotel, was given a big, tame rattle-snake in place of an alarm clock. In the night, aroused by a din, he found a burglar with the snake around his neck rattling for a policeman. The happiest man is one who was never born, but not one in a million has such good luck. Some people are so disgruntled that their hair does not fit. A dog jumped across a well in two jumps. A conceited man: "Waiting for a vacancy in the Trinity." A goat one day ate a fireman's red shirt. For this he was condemned to die and firmly tied to a railroad track. He soon trotted back. He had coughed up the shirt and flagged the train.

It is striking to a cultivated adult to note the keen responsiveness of a popular audience at a cheap theater where every comic turn, jest, and even gag is received with peals of laughter. A poised cultivated man may perceive and enjoy everything perhaps as well but without even once smiling. His perception is less absorbed but he hears and evaluates all as art and with more judgment, and yields less to the stage illusion of reality. He enjoys, also, the contagious enjoyment of others; yet he can laugh inwardly without doing so outwardly even while he criticizes. To him the author of a play, the whole problem of dramaturgy, as well as the audience, is a "part of the show." He does more meditation and thinks it over afterwards. He is also experienced in life and in the theater, so that both the charm and the shock of novelty are lost. His pleasure is more elevated and diffuse and so less noisy and explosive. Instead of muscular demonstration he is spurred to new suggestiveness and his ferment is less effervescing and he cogitates rather than cachinnates; his instant feelings are more sublimated into intellect, and so he both loses and gains. He gets nearer to the viewpoint of the playwright than to the vulgarian's. It is all a part of the great *Comédie Humaine*. But his refinement must not make him obtuse to and still less censorious of all the chipperness and chaffy persiflage of all the ninnies, zanies, costers, driveling doters, and to all the contraptions and bizarreries of the stage witlings, loud and inelegant as it all may seem. He, too, has been a child and youth himself and once responded in the same way, and so he may here again get into vital touch with what man as such laughs and cries at. His sympathies should expand and not contract. If he would leave his judgment and learning at home and abandon himself to the spirit of the place he would be invigorated and refreshed and more in contact with all things human, and so less aloof, apart and desiccated. The new types of clowns like Chaplin, Arbuckle, Sennett, are American contributions which could have been made in no other land. Their drolleries are a new concoction of childish naïveté, downright imbecility and odd drollery utterly impossible in real life, and the laugh is at the original creation of a depth of preposterousness beneath the level of the lowest intelligence, the very existence of which had never been suspected before and is slowly making obsolete the old caricatures of different nationalities (Paddy, Dago, Yankee, Jew and the rest) which we so long enjoyed.

Laughter and the comic are often explained as expressions of the sense of freedom. A loose wheel the French call *gaie*, and the earth in drought is *foule*. Laughter is or should be disinterested, with no end in itself. Long before man knew law, constraint, or the beginnings of science, myth and fancy were free and happy. We love to see rules and uniformities broken. Children laugh at deformity, at the unexpected, and at all freaks of nature. We love occasionally to see things derailed and turned topsy-turvy as in hoaxes, sudden chances and surprises, and this all because we have a loathing for rigor and control. We love to see organized rational processes give way to those that are uncontrolled, emotional, whimsical, to see voluntary movements replaced by those that are hereditary, attention by inattentive liberty, the habitual by the exceptional.[5] Darwin long seemed to many a huge joke. When we are most sportive thus we have the most intense consciousness of freedom. Caprice and abandon are prone to preposterous, rare, and perhaps almost insane things. Thus the coruscations of wit are the apotheosis of intellectual liberty where we live for the nonce in a chaotic world of chance and are utterly lawless, flouting custom, order, regimentation. This tendency may go so far as to become dangerous to authority and to institutions, as were the ancient Bacchantes,[6] but it gives elasticity, suppleness and *élan* and is a kind of infective mental inebriation. This is why laughter is most common in the young and keeps us young and spontaneous.

This view, which has a few thoroughgoing and many partial advocates, seems almost the exact opposite to Bergson's theory of mechanization. It recognizes that modern life abounds in repression, conscious and unconscious, as do the Freudians, and that these may become so irksome that we yearn at times to throw them off and revel and riot as we list, forgetful of all restraint. As Jahn and the German Turners strove to do everything of which the body was capable, take every attitude and do every act physiologically possible to our bones and muscles and make every combination of motor element, and thus to restore to the body all the powers that it has ever had but is steadily losing under our industrial civilization, so this conception of the comic if put to work would have us make every possible combination of mental elements besides the few we need, or science or criticism sanctions, in order to limber and mobilize the soul or to pick up lapsing functions and thereby to reanimate and rejuvenate. This idea is inspiring and has never been at all adequately wrought out. It does not, however, jibe with the views of Gevaert that the world is losing the power of true hilarity, for all admit that it is growing freer and therefore on this view should be gayer. Inadequate as this view is as a full and final explanation, geneticism adopts it as an important factor in its larger and synthetic theory which makes it accord well with both Bergson and Gevaert. Ancestral and decadent psychic mechanisms and rudiments are awakened and rejuvenated with intense conscious delight because they add to the present powers of man what he had in the past but had well nigh lost, and this revival would be impossible save in an atmosphere of freedom, not to say license. Again, if the world grows somber as it grows free, it is because as external restrictions are destroyed, as all admit they are in the progress of history, they are replaced by self-imposed ones, so that our servitude though now voluntary is no less severe than when it was constrained. Only if and in so far as this self-enthrallment has supervened on the world is joy abated, and how far this has gone is the question. Man has been proper, decent, judicial, and scientific but a very short time compared with the long history of his race, and he is very prone to slip in thought, word, if not in deed, the leash of conventionalities and be all himself again if only in a flitting moment, and to revert to the prelogical stage of wild fancy and the prelinguistic stage of cachinnation. He is like a potted house plant in the north that dreams of its native tropical jungle, like a domesticated stabled animal that longs to cavort, frisk and snort in the old unfenced pastures of ancient feral days, and this he does when he "gets funny." He is weary of being stable fed and wants to nibble and browse and taste again the old gamy flavor of the wildwood and the prairie, to woo folly and "cut up" as madly as he can. Alas for him who does not and cannot thus at times renew the youth of the race in him, for cadaveric rigidity has begun.

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[5] See especially Penjon. *Rev. Philos.*, 1893, p. 113 *et seq.* Also Kline. *American Journal of Psy.*, 1907, p. 42 *et seq.*

[6] See A. W. Verrall: "The Bacchantes of Euripides." Cambridge, 1910, pp. 162.

(*To be continued in a later number*)

BOOK NOTES

Exceptional Children and Public School Policy. By Arnold Gesell. New Haven, Yale U. Press, 1921. 66 p.

This unpretentious little pamphlet is the best and most practical review of the vast subject known to us. In the fall of 1918 a mental survey of the elementary schools of the city of New Haven was undertaken cooperatively, and the subject, although local, is here treated in such a manner that any school board or individual can get a comprehensive glimpse of the problem without undue distraction by details. Exceptional children constitute a liability or asset which should be recognized everywhere in public policies, and this is a problem for the schools. In successive chapters the author treats of mental hygiene and the public school, a survey of 24,000 school children, subnormal mentality, superior and atypical mentality, school provisions for mentally deficient children, and exceptional school children and state policy. The pamphlet contains numerous tables and is illustrated by many cuts.

The Alexander-Dewey Arithmetic. By Georgia Alexander. Ed. by John Dewey. N. Y., Longmans, Green and Co., 1921.

This series of arithmetics, elementary, intermediate, and advanced, arises from the realization that the mathematics taught in the schools of a democracy must function in: (1) Clear and independent thinking as a preparation for business, science, and industry; (2) Skill in mathematical computation; (3) Civic responsibility which will carry into action whatever is needed for the welfare of the community.

The Stages of Human Life. By J. Lionel Taylor. N. Y., Dutton, 1921. 377 p.

The author is a member of the Royal Sanitary Institute, London, and university extension and tutorial lecturer in biology and sociology, and has given us here a very interesting book of special value and significance to teachers. His point of view is personal and developmental hygiene, but the most interesting and original part of it is a characterization of the different stages of life, the antenatal period, nascency, infancy, weaning, childhood, pubescence, adolescence, the bodily call and its control, mental growth and awakening during adolescence, to which several chapters are devoted; maturity and the parentage problem, and finally old age, mortality, and immortality. There are too few references but many quotations, and the chief value of the book consists in that it regards pedagogical problems from the paidological point of view.

The Story of Mankind. By Hendrick Van Loon. N. Y., Boni and Liveright, 1921. 479 p.

This book might well have been suggested by Wells, while the author's introduction suggests Patrick Geddes' Outlook Tower in Edinburgh. Besides eight colored pictures it has some scores of ruder maps and woodcuts illustrating its theme, and the type and entire get-up of the book is attractive. After a very brief paleontological introduction and another on primitive man, the book really begins with ancient Egypt and ends with the new world after the war. It is thus a kind of historic primer and is evidently addressed to students in a rather elementary grade of historic study. The style is graphic and lively. Specialists will doubtless cavil at the many inaccuracies and personal *obiter dicta* that abound, but even the latter and the second-person style throughout add to the liveliness and picturesqueness of the story. In the chapter on Joshua of Nazareth or Jesus the author prints a letter of Aesculapius Cultellus and its reply as if it were an authentic document. The student will find plenty to criticize in a book of this kind, but it seems to the writer of this note to have high pedagogic value.

Origin and Evolution of the Earth. By ALBERT CHURCHWARD. Lond., 1921. 511 p.

The main thesis of this author is that we have yet living human beings illustrating practically every stage of the development of man from the lowest type up. Those lowest down in the scale have been often driven away into inaccessible places, especially by the nilotic Negro, as they have been driven into isolation by the stellar muthos people. Original or primary man arrived about two million years ago, and the earliest pigmoid non- or pre-totemic people are the lowest of all. Those who went South developed into the Bushmen and Hottentots; those who went West into the Negro; the eastern branch into the nilotic, the North into the non-hero cold people. All believed in a great spirit, in propitiating the elementary powers and departed spirits, had dances as sign language, knew mythology, folklore, magic, initiations, or tribal marks, and their implements were very primitive and limited. The book consists in the comparison of relics of lower existing races with those which anthropology studies, and in a description of the life and customs of the lowest existing races. Very important are the many photographs, many of which are very remarkable and shed new light upon many problems and some of which do seem to represent stages of culture practically almost unknown before.

Les Hommes Fossiles. By M. BOULE. Paris, 1921. 491 p.

This review of the elements of human paleontology, with its more than two hundred cuts, is by far the most valuable introduction to the subject that has ever yet appeared between two covers. The erudition of the author is remarkable, and in selecting the cuts and the facts stressed from far vaster material he has shown excellent judgment. The many schematic tables found in the book add very greatly to its pedagogic value so that it is a godsend to all teachers of this subject.

Prostitution in the United States. By HOWARD B. WOOLSTON. N. Y., The Century Co., 1921. 360 p.

This is volume I of a series published by the Bureau of Social Hygiene and discusses the subject prior to the entrance of the United States into the world war. After a historical background, the successive chapters are entitled: The Prostitute, Patrons and Exploiters, Segregated Districts, Vice Resorts, White Slavery, Venereal Disease, The Police, Law and the Courts, Regulatory Agencies, Constructive Social Forces, Summary and Conclusion. After reporting the results of this extended survey in 1917 the author was called to service in the war. He promises us another volume on this subject, based upon his experiences with vice during the war. At the end of the book he enumerates a score or two of reformatory agencies and ideals which he thinks, if carried out, would suppress this evil and involve a great advance in civilization itself.

Pedagogical Hints from the Results of a Survey of a San Francisco Public School of Delinquent Boys. By LILLIEN J. MARTIN. San Francisco, Mental Hygiene Publication No. 5, 1921. 18 p.

Dr. Martin in this thoroughgoing study of a large group of delinquent boys has not only recognized the importance of psychoanalysis for many of the cases but has made a study of their emotional traits and grouped them accordingly under the heads choleric, phlegmatic, excitable, stubborn, destructive, lachrymose, cruel, hysterical, moody, etc. She strongly urges the importance of analysis not only for exceptional but for all boys of this age and insists upon very varied individual treatment to be based upon such investigation.

Why We Read. By S. P. B. Mais. Lond., 1921. 211 p.

These are pithy guides to reading and epitomes of standards old and new, nine English classics, twelve contemporaries including the philosopher, Santayana, four books on the English language, and an excellent sketch of ten foreigners from Montaigne to Tolstoi.

Man In India: A Quarterly Record of Anthropological Science with Special Reference to India. Ed. by Sarat Chandra Roy. Ranchi, 1921. Vol. I, No. 1, pp. 1-88; No. 2, pp. 89-174.

This new journal promises to be of great interest. The attractive original articles are a program for anthropological investigations in India, kinship and marriage, anthropological research, human sacrifice in central India, the decline of the birth-rate in various areas of India, folklore and the folklore society, ethnographic notes and queries, Indian ethnology in current literature, with book reviews and correspondence.

Measuring Minds. By Garry and Caroline C. Myers. N. Y., Newson & Co., 1921. 55 p.

This is an examiner's manual to accompany Myers' "Mental Measuring," which is included. It is a model of simplification.

La Science de L'Education. By J. Demoor and T. Jonckheere. Brussels, Lamertin, 1922. 436 p.

This is the second and revised edition of this important and comprehensive work, the best of its kind we know of in French.

State Laws and Regulations Governing Teachers' Certificates. By Katherine M. Cook. Wash., Bureau of Education, Bull. No. 22, 1921. 244 p.

Ole Marster and Other Verses. By Benjamin B. Valentine. Richmond, Whittet and Shepperson, 1921. 117 p.

The Work of a Mental Hygiene Clinic for Pre-school Age Children. By Lillien J. Martin. San Francisco, Cal. Soc. for Ment. Hygiene, 1921. 3 p.

Mental Survey of Utah Schools and Adaptation of the Army Beta Tests. By George S. Snoddy and G. E. Hyde. Salt Lake City, U. of Utah, 1921. 28 p.

Gainful Employment for Handicapped Women. By Lucile Eaves. Bost., Women's Ednl. Union, 1921. 32 p.

The Parataxes: A study and analysis of certain borderline mental states. By T. V. Moore. Repr. *Psychoanalytic Rev.*, vol. 8, No. 2.

Opdragelse og Vernekraft. By Martin L. Reymert. Kristiania, With and Co., 1921. 82 p.

Viewpoints in Biography: An arrangement of books according to their essential interest. By Katherine Tappert. Chic., Amer. Library Assn., 1921. 69 p.

The Marking System of the College Entrance Examination Board. By L. T. Hopkins. Cambridge, Harvard Univ., 1921. 15 p.

The Educational Screen. The Independent Magazine Devoted to the New Influence in National Education. Chicago, The Educational Screen, Inc., 1922.

This is a monthly journal representing the educational work, actual, desirable, and possible, which movies can accomplish. If it can maintain the level of excellence of the first two numbers it will be a journal of interest and value to all progressive educators.

Education for the Disabled in War and Industry. By A. G. Crane, N. Y., Teachers College, 1921. 83 p.

The Function of Ideals and Attitudes in Social Education. By Paul F. Voelker. N. Y., Teachers College, 1921. 126 p.

Interest Factors in Primary Reading Material. By Fannie W. Dunn. N. Y., Teachers College, 1921. 70 p.

Trade Tests in Education. By Herbert A. Toops. N. Y., Teachers College, 1921. 118 p.

The Place of the Elementary Calculus in the Senior High-School Mathematics. By Noah B. Rosenberger. N. Y., Teachers College, 1921. 81 p.

Changes in Mental Traits with Age. By Fowler D. Brooks. N. Y., Teachers College, 1921. 86 p.

The Misinterpretation of Locke as a Formalist in Educational Philosophy. By Vivian T. Thayer. Madison, U. of Wisconsin, 1921. 24 p.

Annual Report of the General Education Board, 1920-1921. N. Y., 1922. 127 p.

The Palmer Method of Business Writing (Spanish edition). By A. N. Palmer. N. Y., The Palmer Co., 1921. 95 p.

Scales for Measuring Results of Physics Teaching. By Harold L. Camp. Iowa City, Publ. by the University, 1921. 51 p.

Englands Lazarettschiffsmishrauch Während des Weltkrieges. By Friedrich Lützow. Berlin, Meyer, 1921. 91 p.

Der Lusitania-Fall. By Friedrich Lützow. Leipzig, 1921. 16 p.

Unterseebootskrieg und Hungerblockade. By Friedrich Lützow. Berlin, Meyer, 1921. 51 p.

Proceedings of the American Medico-Psychological Association. Baltimore, The Lord Baltimore Press, 1921. 428 p.

Juvenile Delinquency. By Henry H. Goddard. N. Y., Dodd, Mead and Co., 1921. 120 p.

The author is perhaps our leading American authority on mental inferiority in children, to which he has made extremely valuable contributions. This theme is closely connected with delinquency, and all the many who have followed Dr. Goddard's work will be grateful to him that he has put his conclusions upon this topic in such concise and lucid form, and also that he has made it all the more concrete by so many illustrative cases. It is a work that everyone interested in abnormal children should read.

A Psychiatric Milestone: Bloomingdale Hospital Centenary, 1821-1921. N. Y., The New York Hospital, 1921. 219 p.

The opening of Bloomingdale Asylum on June 1, 1821, was an important event in the treatment of mental disorders and the progress of humanitarian and scientific work in America, and this volume tells us of the very fitting ceremonial which marked the close of the century. It very appropriately begins with a historical review by Edward W. Sheldon, followed by a very interesting paper by Dr. Adolf Meyer on The Contributions of Psychiatry to the Understanding of Life Problems and another by Dr. L. F. Barker on The Importance of Psychiatry in General Medical Practice.

Federal Citizenship Textbook. By Raymond F. Crist. Wash., Govt. Printing Office, 1921. 104 p.

This is Part III of a course of instruction for the use of public schools by the candidate for citizenship and is published by the U. S. Department of Labor. It consists of a study of the Declaration of Independence put lesson-wise with the hard words explained, followed by a similar study of the Constitution of the United States, section by section, in reading lessons. We are incidentally given some account of the President's house and the Washington Monument.

The Child and His School. By Gertrude Hartman. N. Y., E. P. Dutton and Co., 1922. 248 p.

The sub-title of this book is: An interpretation of elementary education as a social process. This industrious writer ends her book with a bibliography of 850 titles or some fifty-six pages exiguously classified and limited, we believe, entirely to works in the English language. The books she cites cover a far greater range than does her text and yet we notice many omissions of articles and books that should be included in her list. Those who are familiar with John Dewey, who is constantly quoted and followed in all essentials, will find little that is new here despite its rather ostentatious display of references at the end of every chapter. To the reviewer it seems a very inadequate and one-sided treatment of a very vast topic.

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THE HISTORICAL BACKGROUND OF MEDIEVAL INTELLECTUAL INTERESTS

A STUDY IN PAGANISM, CHRISTIANITY AND THE DECLINE OF ANCIENT SCIENCE[1]

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I. INTRODUCTORY

In an earlier paper on the relation between history and the history of science,[2] I endeavored to show that the historian could be most helpful to the scientist interested in the history of science through inculcating the canons of historical research, in order to secure a more critical use of the sources of information, and by indicating the general cultural conditions of any epoch which have encouraged or retarded the growth of those attitudes of mind which are essential to the flourishing of any healthy scientific activity.

The acquisition of a knowledge of the technique of historical research is something which can come only from a long-standing and reverent contact with such works as those by Bernheim, Wolf, and Langlois and Seignobos, and cannot fall within the scope of such a paper as this. In illustrating the other phase of a possible fruitful relation between history and the history of science two periods of particular pertinence might be chosen. One is the era of the decline of ancient science, and the other that of the scientific revival of the seventeenth century. From considerations of both logic and chronology I have chosen the first of these periods as that upon which to base a brief analysis of the manner in which a knowledge of cultural conditions and intellectual attitudes at large is helpful in understanding the status of, and the tendencies in, natural science. It will be my aim to point out the more important historical causes for the decline of the scientific interests and activities of the Hellenic world, and for the impossibility of the development of any creative scientific endeavor until the Patristic orientation had been eliminated with the gradual growth of a different outlook and attitude after the passage of more than a thousand years.[3]

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[1] Paper prepared for the Toronto Meeting of the American Association for the Advancement of Science, Section on the History of Science, December, 1921.

[2] "The Historian and the History of Science," in *Scientific Monthly*, August, 1920.

II. Aspects of "Pagan" Culture in the Classical World which Obstructed the Development of Science

1. The Problem of the Decline of Ancient Science—Every student of intellectual history and the history of science is aware of the remarkable progress of the Greeks in the realm of natural science, including the brilliant origins with Thales and the Milesian group in the sixth and fifth centuries B. C.; the introduction of the atomic theory and a mechanistic theory of causation by Leucippus and Democritus; Aristotle's comprehensive work in scientific description and classification; the origins of medical science with Hippocrates; and, above all, the astonishing achievements of the scientists of the Hellenistic age—Euclid, Aristarchus, Eratosthenes, Archimedes, Hipparchus and Hero.[4]

Looking at this imposing advance from the crude beginnings of the Egyptians and the Babylonians, *purely from the standpoint of the development of science,* it is difficult to see why the process did not keep on after Hipparchus and Hero, develop applied science, and produce the modern scientific and industrial world two millenniums earlier than it actually was attained. The writer well recalls, in fact, that, as a student in one of the more noted courses on the history of science in this country, he listened to a confession on the part of the professor that scientists were at a loss to account for the decline of ancient science. The instructor placed his faith in a guess that it was because of the disintegration and disunity of Greek political life, but, as historians have made clear, Greek political conditions were more disturbed during the period of maximum scientific activity than during the age of its decline.

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[3] By all odds the best guide and bibliography for the field of this paper is to be found in Parts II-III of J. H. Robinson's "Outline of the History of the Western European Mind." The two most useful books, on the whole, are H. O. Taylor's "Classical Heritage of the Middle Ages" and "The Medieval Mind." I have endeavored to include as quotations some of the more notable passages from the better known books on the topics considered.

[4] Sedgwick and Tylor, "Short History of Science," Chaps. III-VI.

Yet, when the historian of culture views the classical and Patristic periods, the chief problem which confronts him is not why ancient science declined, but why it was able to persist as long as it did. He finds that nearly all phases of intellectual life, most of the prevailing attitudes of mind, and the social and economic conditions were either fundamentally opposed to the scientific frame of mind or were, in varying degrees, obstructive of the influences which would promote scientific activity. He feels the force of Professor Robinson's assertion that "there was no form of ignorance or of perversity of thought left for the Middle Ages to discover."

2. *The Weaknesses of Hellenic Science*—First, perhaps, might be mentioned the very nature of ancient science itself. Some of the more important weaknesses of ancient science were illustrated by Aristotle.[5] His penchant for finality and definiteness in classification and arrangement of data, clarifying as it was, savored of logic quite as much as of science. His sanctification of Empedocles' animistically derived notion of the four fundamental elements prevented the adoption of the sensible atomic theory of Democritus, and held physics and chemistry in bondage until the time of Paracelsus, Boyle and Stahl. His erroneous notions with respect to static and dynamic mechanics and his fantastic cosmology tended to obscure the accurate work done along this line by the Alexandrian and Hellenistic scientists, and, by its ascendency in scholastic thought, proved an obstruction to the growth of modern science as well. Then, his compiling tendency, valuable, perhaps, in his own hands and in those of Ptolemy, became, as early as Pliny, the vehicle for setting down as plausible vast masses of pseudo-scientific monstrosities, many of them accepted on the strength of tradition or gossip. The introduction of astrology not only brought many grotesque errors into every phase of thought, but specifically hindered the progress of astronomy.[6] The physiological chemistry, resting on the basis of the theory of the four humors, which constituted the "scientific" basis of the classical theory of pathology, not only was fatal to physiological chemistry, but also made difficult any definite progress in medical science, especially after this notion had been sanctified by Hippocrates and Galen, much as Aristotle had

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[5] A. E. Taylor, "Aristotle"; and T. E. Lones, "Aristotle's Researches in Natural Science."

[6] A. Bouché-Leclercq, "L'Astrologie grecque"; F. Cumont, "Astrology and Religion among the Greeks and Romans."

perpetuated the allied notion of the four elements of Empedocles.[7]

Even the remarkable science of the Hellenistic period possessed its definite limitations. Archimedes and Hipparchus carried it about as far as it was possible with the existing modes of scientific endeavor and the technique for research. They had few or no instruments of precision, such as the microscope, balance, stop-watch and thermometer, a circumstance which prevented their inductive investigation from going beyond relatively superficial externals. An unwillingness to observe the commonplace, growing partly out of the Greek enthusiasm for the aesthetic and the transcendental, and partly out of the contempt for mundane matters through their association with servile labor, discouraged that observant attitude which is the beginning of all true scientific endeavor. A primary interest in absolutes and transcendentals, which was characteristic of the Greeks, led to a lack of concern with the changing and the dynamic aspects of the world of sense-phenomena, and prevented a general acceptance of the evolutionary concepts of Heracleitus and the Epicureans. Finally, there should be noted the Greek inability to make a practical application of the scientific knowledge they acquired. Though Hero, for example, had produced the turbine engine a hundred years before the Christian era, he could think of no more useful purpose to which to apply it than to furnish wondering amusement through opening temple doors. Though Archimedes produced many practical devices which might have been of the greatest industrial significance, especially his development of the principles of the lever and pulley, he did little more with them than to provide edification and amusement for King Hiero of Syracuse. Professor Robinson has admirably summarized these reasons why Greek science and thought were not adapted to producing indefinite progress and why they did not bring about the régime of applied science and industrialism during the period of the existence of the Hellenistic world:[8]

> After two or three hundred years of talking in the market place and of philosophic discussions prolonged until morning, such of the Greeks as were predisposed to speculation had thought all the thoughts and uttered all the criticisms of commonly accepted beliefs and of one another that could by any possibility occur to those who had little inclination to fare forth and extend their knowledge of the so-called realities of nature by painful and specialized research and examination. This is to me the chief reason why, except for some advances in mathematics, astronomy, geogra-

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[7] F. H. Garrison, "Introduction to the History of Medicine," p. 59 ff.

[8] J. H. Robinson, "Mind in the Making," p. 111-3.

> phy, and the refinements of scholarship, the glorious period of the Greek mind is commonly and rightfully assumed to have come to an end about the time of Aristotle's death. Why did the Greeks not go on, as modern scientists have gone on, with vistas of the unachieved still ahead of them?
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> In the first place, Greek civilization was founded on slavery and a fixed condition of the industrial arts. The philosopher and scholar was estopped from fumbling with those everyday processes that were associated with the mean life of the slave and servant. Consequently there was no one to devise the practical apparatus by which alone profound and ever-increasing knowledge of natural operations is possible. The mechanical inventiveness of the Greeks was slight, and hence they never came upon the lens; they had no microscope to reveal the minute, no telescope to attract the remote; they never devised a mechanical timepiece; a thermometer, nor a barometer, to say nothing of cameras and spectroscopes. Archimedes, it is reported, disdained to make any record of his ingenious devices, for they were unworthy of the noble profession of a philosopher. Such inventions as were made were usually either toys or of a heavy practical character. So the next great step forward in the extension of the human mind awaited the disappearance of slavery and the slowly dawning suspicion, and final repudiation, of the older metaphysics, which first became marked some three hundred years ago.

Roman science was, in the main, but an inferior imitation of Hellenic science. While the Romans certainly made notable contributions to the field of structural engineering, these rested much more on intuition and practical ingenuity than upon the understanding of the technical phases of the science of mechanics. They did little or nothing to advance the natural sciences, while, in the matter of the compilation of pseudo-science in such works as Pliny's "Natural History," they did much to degrade science and to block the operation of the strictly scientific impulses and procedure. Ancient science in itself thus furnished limitations upon its own development. Infinitely more important, however, in obstructing the growth of ancient science were the various non-scientific and anti-scientific currents of thought and attitudes of mind which dominated the classical world.

3. The Ascendency of Metaphysics in Hellenic Thought—Perhaps the most important aspect of classical intellectual and cultural conditions in obstructing the progress of scientific thought was the tendency towards metaphysical thought, which was a primary characteristic of Hellenic thinking. Professor Robinson thus comments upon this development in Greek thought:[9]

> The second great discovery of the Greek thinkers was *metaphysics*. They did not have the name, which originated long after in quite an absurd fashion, but they reveled in the thing. Nowadays metaphysics is revered by some as our noblest effort to reach the highest truth, and scorned by others as the silliest of wild-goose chases. I am inclined to rate it, like smoking, as a highly gratifying indulgence to those who like it, and, as

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[9] Robinson, *Ibid*, p. 102-3.

indulgences go, relatively innocent. The Greeks found that the mind could carry on an absorbing game with itself. We all engage in reveries and fantasies of a homely, everyday type, concerned with our desires or resentments, but the fantasy of the metaphysician busies itself with conceptions, abstractions, distinctions, hypotheses, postulates, and logical inferences. Having made certain postulates or hypotheses, he finds new conclusions, which he follows in a seemingly convincing manner. This gives him the delightful emotion of pursuing Truth, something as the simple man pursues a maiden. Only Truth is more elusive than the maiden and may continue to beckon her follower for many long years, no matter how gray and doddering he may become.

The significance of this type of thought in turning the Hellenic world aside from the observing mood and the concern with the concrete, essential to the scientist, can scarcely be overestimated. H. O. Taylor says: "The older Greek philosophies had sprung from open and unprejudiced observation of the visible world. They were physical inquiries. With Socrates philosophy turned, as it were, from fact to truth, to a consideration of the validity of human understanding. Thereupon the Greek mind became entranced with its own creations."[10] In a similar vein John Dewey writes: "There are, indeed, but two alternative courses. We must either find the appropriate objects and organs of knowledge in the mutual interactions of changing things; or else, to escape the infection of change, we *must* seek them in some transcendent and supernal region. The human mind deliberately, as it were, exhausted the logic of the changeless, the final, and the transcendent, before it essayed adventure on the pathless wastes of generation and transformation."[11] So obsessed were the great Greek minds with the lofty and desirable nature of abstract speculation that Aristotle's notion of God was that of a being eternally absorbed in contemplation and divine introspection.[12]

Beyond this general *Tendenz* towards enthusiasm for the metaphysically obtained "realities," which appeared at its best in the philosophy of Aristotle, the Stoics and the Epicureans, there were special variations and manifestations of this characteristic which were even more deadly to scientific thought. Perhaps the least offensive of these was the idealism of Plato. Turning with his master, Socrates, away from the Sophistic emphasis on the relativity of knowledge and the significance of the concrete and specific, he sought reality in transcendental types. Unable to endure the thought that either the universe or man was like "a leaky pot or a man running at the nose," he endeavored to attain philosophic and aesthetic consolation in the contention that reality existed only in the ideal type, form or pattern, of which concrete and specific examples were but lowly, imperfect and ephemeral manifestations. Mr. Taylor has well summarized the significance of this attitude and position for the discouragement of the truly scientific approach to the study of natural phenomena:[13]

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[10] H. O. Taylor, "The Medieval Mind," third American edition, Vol. I, p. 34-5.

[11] J. Dewey, "The Influence of Darwinism on Philosophy and other Essays," p. 6-7.

[12] C. M. Bakewell, "Source-Book in Ancient Philosophy," p. 233-5.

> With Platonists—and the world was always to be filled with them—perceptions of physical facts and the data of human life and history, were henceforth to constitute the outer actuality of a creation within the mind. Every observed fact is an apparent tangibility; but its reality consists in its unison with the ultimate realities of rational conception. The apprehension of the fact must be made to conform to these. For this reason every fact has a secondary, nay, primary, because spiritual meaning. Its true interpretation lies in that significance which accords with the mind's consistent system of conceptions, which present the fact as it must be thought, and therefore as it is; it is the fact brought into right relationship with spiritual and ethical verity. Of course, methods of apprehending terrestrial and celestial phenomena as illustrations of ideally conceived principles, were unlikely to foster habits of close observation. The apparent facts of sense would probably be imaginatively treated if not transformed in the process of their apprehension. Nor, with respect to the human story, would such methods draw fixed lines between the narration of what men are pleased to call the actual occurrence, and the shaping of a tale to meet the exigencies of argument or illustration.

4. *Neoplatonism and the Mystic Attitude*—Much more deadly to the cultivation of scientific outlook and interests was Neoplatonism, which took its origin from one of the more mystical of Plato's works, the "Timaeus." It was elaborated by Posidonius of Rhodes, and much later, by an Egyptian Platonist, Plotinus (204–270 A. D.). The world of sense-phenomena—the whole field of the work of the scientist—was utterly spurned by Plotinus as unworthy of consideration by man. The concrete and material were, at best, but a necessary evil. Plotinus is said to have expressed shame, humility and embarrassment at having possessed a physical body. The metaphysical realm of the pure contemplation of the transcendental—the ideal and divine world of Plato and Aristotle—was more highly esteemed by Plotinus than the world of sense, concrete and changing, but it was not the perfect world of mental activity. This was to be found in the regions of the Absolute, which could be reached only through vision and ecstasy. This realm of emotion and ecstasy, and its goal, the Absolute, were something in which neither observation, nor reason, nor analysis had any part whatever. The

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[13] Taylor, "The Medieval Mind," Vol. I, p. 35.

Absolute was ineffable, and faith and reverence were the only proper attitudes to be maintained in its quest.[14] The intellectual bankruptcy implied in the Neoplatonic approach to the problems of knowledge and experience has thus been stated by Adolph Harnack, the famous historian of Christian thought:[15]

> The contempt for reason and science (for these are contemned when relegated to a second place) finally leads to barbarism, because it results in crass superstition, and is exposed to all manner of imposture. And, as a matter of fact, barbarism succeeded the flourishing period of Neoplatonism. . . . The masses grew up in superstition, and the Christian Church, which entered on the inheritance of Neoplatonism, was compelled to reckon with this and come to terms with it. Just when the bankruptcy of the ancient civilization and its lapse into barbarism could not have failed to reveal themselves, a kindly destiny placed on the stage of European history certain barbarian nations, for whom the work of a thousand years had as yet no existence. Thus the fact is obscured, though it does not escape the eye of one who looks below the surface, that the ancient world must necessarily have degenerated into barbarism of its own accord, because of its renunciation of this world. There was no longer any desire either to enjoy it, to master it, or to know it as it really is. A new world had been disclosed for which everything in this world was to be given up, and men were ready to sacrifice insight and understanding, in order to possess that other world with certainty. In the light which radiated from the world to come, that which in this world appeared absurd became wisdom, and wisdom became folly.

In the works and teachings of some of the followers of Plotinus the intellectual degradation proceeded much further. With Iamblichus (B. C. 300), there developed the thesis that unbounded credulity was a moral principle, that the divine methods and manifestations were essentially miraculous and supernatural, and that the chief purpose of philosophy was to inculcate the essential wickedness of disbelieving or questioning anything which related to the gods or their alleged actions. Magic and theurgy were the noblest of possible human practices.[16] Taylor has admirably summarized the mental collapse represented in the views of Iamblichus:[17]

> There was no conflict, but complete surrender and happy abandonment in Iamblichus the Divine (θεῖος) who when he prayed might be lifted ten cubits from the ground—so thought his disciples—and around whose theurgic fingers, dabbling in a magic basin of water, Cupids played and kissed each other. His life, told by the Neo-Platonic biographer, Eunapius, is as full of miracle as the contemporary Life of St. Antony by Athanasius. Iamblichus floats before us a beautiful and marvellously garbed priest,

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[14] T. Whittaker, "The Neo-Platonists"; W. R. Inge, "The Philosophy of Plotinus."

[15] A. Harnack, "History of Christian Dogma," Vol. I, p. 337-8; cited in Robinson, "The New History," p. 112-13.

[16] Whittaker, *op. cit.*, p. 122 ff.

[17] Taylor, "Medieval Mind," Vol. I, p. 47, 47-8, 48-9.

> a dweller in the recesses of temples. He frankly gave himself to theurgy, convinced that the Soul needs the aid of every superhuman being—hero, god, demon, angel. He was credulous on principle. It is of first importance, he writes, that the devotee should not let the marvellous character of an occurrence arouse incredulity within him. He needs above all a "science" which shall teach him to disbelieve nothing as to the gods. For the divine principle is essentially miraculous, and magic is the open door, yes, and the way up to it, the anagogic path.
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> There is no lower depth. Plotinus' reason-surpassing vision of the One (which represents in him the principle of irrationality) is at last brought down to the irrational act, the occult magic deed or word. Truly the worshipper needs his best credulity—which is bespoken by Iamblichus and by this book. . . .
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> So low sank Neo-Platonism in pagan circles. Of course it did not create this mass of superstitious fantasy. It merely fell in cordially, and over every superstition flung the justification of its principles. In the process it changed from a philosophy to a system of theurgic practice. The common superstitions of the time, or their like, were old enough. But now—and here was the portentous fact—they had wound themselves into the natures of intellectual people; and Neo-Platonism represents the chief formal facilitation of this result.

The historical significance of Neoplatonism relates not merely to its origins and manifestations among the pagans of the period of classical decline. It furnished the intellectual framework and background for Patristic thought and provided the mental orientation for much of medieval thought and culture.[18]

5. *Rhetoric and the Substitution of Well-said for Well-done*—Another phase of the decadence of pagan thought was the development of the popularity of rhetoric and the love of flowery language and sonorous phrases. This not only corrupted history, but also diverted intellectual attention away from the concrete realities with which science deals, and centered interest and approval upon the aesthetic fictions of the imagination of the orator. It tended to build up a satisfaction with words and phrases, in the place of facts and concrete achievements. "Well-said" was substituted for well-done as the criterion of excellence. It was as fatal to interest and achievement in science as the Neoplatonic absorption in the ecstasies of contemplating the absolute, the miraculous and the supernatural. Professor Bury has well summarized the great popularity of rhetoric among the Greeks in the Hellenistic period:[19]

> We may regret this corruption, as we call it, of history. But it is more to the purpose to understand the Greek point of view. It is not easy for us to realize the importance which the art of rhetoric possessed for

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[18] A. Harnack, "History of Dogma," Vol. I, p. 336 ff.; T. Whittaker, "The Neo-platonists."

[19] J. B. Bury, "The Ancient Greek Historians," p. 174-5; cf. H. Peter, "Wahrheit und Kunst," and J. T. Shotwell, "Introduction to the History of History," Chaps. XV, XVIII.

the Greeks, as a purveyor of æsthetic pleasure. Indeed, the history of Greek rhetoric testifies, perhaps as impressively as the history of Greek plastic, to the large part which aesthetic pleasure played in Greek life. For the later Greeks, the declamations of rhetoricians, which we find intolerably tedious to read, had as intense an aesthetic value as the Homeric poems for their remote ancestors, and were listened to with as eagerly attentive and as critical ears. People went to hear a rhetorical display just as we go to hear a symphony. And this interest lasted down to late Graeco-Roman times. Greek prose was always an art in as full a sense as the poetry from which it sprang, regulated by principles and canons, which have no counterpart in modern languages, even in French, and required prolonged study and practice. And rhetoric came to fulfil for Greek audiences the same rôle which had been once fulfilled by the epics. Just as the historians, or as we should say mythologers, of the Homeric age were epic poets, so the later historians were rhetoricians. If the historian were not trained in the school of the rhetorician he would have had few readers.

Among the Romans, rhetoric, having its great expositor and defender in Quintilian, came to be even less original than among the Greeks. Mr. Taylor places it first among the "phases of pagan decadence":[20]

> In general this literary decline was a decline from relevancy of treatment of subjects having real interest to irrelevancy of treatment of subjects having no real interest; from setting forth veritable features of human life to devising preposterous fictions; from large delineation of human character to the absence of any veritable and distinctive characterization of persons real or imaginary; from setting forth the course of human life according to its most truly considered laws to setting it forth in ways of happening and accident, which bear no true relation to character and situation. These decadent traits do not all appear in any one class of compositions; but those writings which exhibit them most strikingly are those which also show characteristics of medieval literature. . . . Thus these latter-day Graeco-Roman writings illustrate how the classical, or rather the Graeco-Roman, or Hellenized Roman personality, was intellectually declining to the level of the men of the early medieval times, whether barbarians by birth or native denizens of the Empire.
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> Rhetorical studies, and compositions of a rhetorical character, illustrate the indiscriminate use of subjects void of real interest, as well as the irrelevancy of treatment even of the subject chosen. Roman rhetoric had been a great civilizer and Romanizer of conquered provinces. The rhetorician followed hard on the army to teach the new provincials the Roman Latin literature, and in a way which fostered oratory and the faculty of turning off rhetorically proper Latin phrases. But under the Empire, oratory, whether practised at Rome or in the provinces, was emptied of its genuine purpose, which is to express opinions held upon public matters in order to influence the action of free fellow-citizens. Outside the business of the law, oratory became empty and insincere. It had its apt preparation in the schools of rhetoric, where the rounding of grammatical periods in prose or verse was everything, while pertinency to anything real in life was nothing. Subjects of study and discourse, rhetorically selected in order to cultivate cleverness of expression, do not bind the writer or speaker to pertinency to the matter in hand. Education by such means may become an education in irrelevancy for the youth of a society which is becoming more and more dilettante as it loses power to shape its destinies.

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[20] H.O. Taylor, "The Classical Heritage of the Middle Ages," p. 33-6.

The result of this rhetorical fostering of irrelevancy is seen in compositions written for an occasion, as a panegyric on an emperor. These are flatteries, if not lies. They may, however, be pertinent. But in declining times the deeds of the great man dwindle, and the orator is tempted to fill out his speech with pretty matters not quite pertinent. At last these panegyrics become models of irrelevancy. The man praised is fulsomely addressed and flattered, and great deeds are heaped on him. Then the orator may pass to regions of mythology—safe topic—nor return. This is one mark of intellectual decline; for pertinency of treatment is as indicative of intellect as is the character of the subject treated and the reality of its relationship to life. It marks one phase of Roman decline that great numbers of such panegyrics were composed, delivered, and immensely admired. They gave Symmachus his reputation; and Sidonius Apollinaris was made *praefectus urbi* as a reward for one addressed to the shadow emperor Anthemius.

6. The Seven Liberal Arts as the Approved Program of Intellectual Interests and Academic Studies—Nothing could better illustrate the decline of the place of scientific interests in classical culture than the accepted classification and program of subjects for pursuit by the intellectually inclined which took form in later paganism under the historic title of the "Seven Liberal Arts"—grammar, rhetoric, and dialectic, or the *trivium*; and geometry, arithmetic, astronomy and music, or the *quadrivium*. These subjects had been for the most part developed, distinguished and isolated as early as the time of Plato and Aristotle. Varro in his "Disciplinarum Libri Novem" had carried further the process of distinction and classification. The definitive exposition of the seven liberal arts was, however, the work of an African Neoplatonist, Martianus Capella, who lived sometime during the fourth or in the early fifth century. Taylor says of his work:[21]

> Perhaps the most widely used school book of the Middle Ages was the "De Nuptiis Philologiae et Mercurii" by Martianus Capella, an African Neo-platonist, who wrote in the first part of the fifth century. It is a work in nine books. The first two are devoted to the allegorical narrative of the marriage of Mercury with the polymath virgin Philology. Mercury seeks a bride; he cannot have Sophia or Mantice or Psyche; Virtus counsels him to ask Apollo's advice, and Apollo advises him to wed Philology. Under the joyful convoy of the Muses and enzephyred by the music of the spheres, Virtus, Apollo, and the bridegroom fly to Jove's palace to ask his consent. A council of the gods is summoned; a favorable decision is reached; the bride shall be raised to divine rank. With the second book she appears, desiring the marriage, but fearful at the greatness of the honor. Her mother, Phronesis, adorns her for the wedding; four noble matrons, the cardinal virtues, greet her, and the Graces, with three mystic kisses, give her courage. Athanasia, daughter of Apotheosis, comes to lead her to Heaven, but first commands her to deliver that with which her bosom is seen to swell; at this she vomits forth many rolls of papyrus and of linen, which are gathered up by the Virgin Artes and Disciplanae, Urania and Calliope helping. The bride now drains the goblet of immortality, and rises to heaven, where Juno Pronuba meets

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[21] Taylor, "Classical Heritage," p. 49-51.

her with offerings. Under the guidance of Juno, she traverses the circles of the planets and reaches the Milky Way, where Jove's palace is. There all the gods and beings known to Latin mythology assemble, with here and there a deity from Egypt, besides the guards of the elements (elementorum praesides) and a most beauteous company of the angelic folk and souls of blessed ancients. Now the bride's prudent mother demands a reading of the tables of the dower and the *lex Papia Poppaeaque*, regarding the property rights of married women. Thereupon Phoebus rises and leads forward, to place with the bridal gifts, seven maid-servants from his brother's household; these are the seven Artes—Ars Grammatica; Ars Dialectica, "a little paler"; Rhetorica; Geometria; Arithemetica; Astronomia; Harmonia. Each one, as Phoebus leads her forward, tells her parentage, and then expounds the substance of her art, most dryly, all virginal allegory laid aside. They have a book apiece, and make up the tale of the nine books of Capella.

This work became the "standard" school book of the Middle Ages. Its form and character anticipates medieval taste, upon which it was to be so influential. It is written in prose and verse, the *chantefable* form; though the song-element is unimportant in the last seven books. These are strictly instructive, and sapless as the rods of medieval schoolmasters. The allegory of the first two books is pleasingly pedantic and the whole work presents the sterile union of fantasy with pedantry, so dear to the closing years of pagan scholarship, when the old straw was thrashed, re-tied in queer-shaped bundles, and then thrashed again. The process produced *pabulum* for coming generations.

The hierarchy of the seven arts was elaborated by Boethius and others, and typical medieval text-books on the arts were provided by Cassiodorus. The concentration of the learned upon the seven liberal arts distinctly diverted their attention from both science and the scientific attitude. Of the two divisions of the arts the *trivium* was much more highly esteemed than the *quadrivium*, and, during the Middle Ages, received the bulk of the concern of students.[22] Even the *quadrivium* itself did not contain the more promising and practical sciences, but merely the most logical and formal. Further, geometry, arithmetic and astronomy did not mean in their medieval content what they did in Hellenistic days or what they do now. Rather, they were chiefly concerned with formal definition and the magic potency of numbers and celestial phenomena.[23] There was, then, nothing in the seven liberal arts which could promote science and little which would not discourage it. With the coming of Christianity the seven liberal arts were regarded as but the hand-maidens of theology, which immediately became the "Queen of the Sciences."

7. The Indiscriminate Compilation of Compendia of Pseudo-Scientific Data and Superstitious Tradition—One of the most conspicuous aspects of the pagan decadence and something which was continued by Christian scholars, was the tendency towards producing enormous compilations of alleged scientific material, accepting tradition, gossip and hearsay as the basis, instead of endeavoring to acquire however small an amount of new knowledge by the patient method of inductive investigation. While some of the best of the earliest of these compilations unquestionably embodied the prevailing scientific notions of their day, they invariably and inevitably included also much pseudo-scientific tradition, and in no case could they add anything to the sum total of human knowledge. The very best compilation is necessarily inferior to the poorest laboratory investigation as a means of extending our scientific information. Most of these compilations, however, embraced but little of the Athenian or Hellenistic science and came more and more to embody the wildest guesses and the crudest superstitions, to which were added by the Christian compilers the miraculous, the allegorical and the anagogical. This process of compilation began, and appeared at its best, in Aristotle. Its course of development and cumulative degradation runs on through Varro's works, Pliny's "Natural History," Ptolemy's "Almagest," the compilations of Boethius, Cassiodorus, and Gregory the Great, Isidore of Seville's "Etymologies," Rhabanus Maurus' "De Universo," Alexander Neckham's "De Naturis Rerum," and Vincent of Beauvais' "Speculum."[24] Mr. Taylor thus summarizes the significance of this compiling tendency for the history of thought and science:[25]

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[22] L. J. Paetow, "The Arts Course in the Medieval Universities," p. 2 ff.

[23] E. Brehaut, "An Encyclopedist of the Dark Ages: Isidore of Seville," p. 89-154.

> For the Latin West the creative patristic epoch closes with the death of Augustine. There follows a period marked by the cessation of intellectual originality. Men are engaged upon translations from the Greek; they are busy commenting upon older writings, or are expounding with a change of emphasis the systematic constructions of their predecessors. Epitomes and compendia appear, simplified and mechanical abstracts of the bare elements of inherited knowledge and current education. Compilations are made, put together of excerpts taken unshriven and unshorn into the compiler's writing. Knowledge is brought down to a more barbaric level. Yet temperament lingers for a while, and still appears in the results.
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> The representatives of this post-patristic period of translation, comment, and compendium, and of re-expression with temperamental change of emphasis, are the two contemporaries, Boethius and Cassiodorus; then Gregory the Great, who became pope soon after Cassiodorus closed his eyes at the age of ninety or more; and, lastly, Isidore, Archbishop of Seville, who died in 636, twenty-two years after Gregory. All these were Latin bred, and belonged to the Roman world rather than to those new peoples whose barbarism was hastening the disruption of a decadent order, but whose recently converted zeal was soon to help on the further

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[24] See selections from such compilations in Brehaut, *op. cit.*, *passim*, R. Steele, "Medieval Lore," and G. G. Coulton, "A Medieval Garner."

[25] Taylor, "Mediaeval Mind," Vol. I, p. 88-9.

diffusion of Latin Christianity. They appear as transmitters of antique and patristic thought; because, originating little, they put together matter congenial to their own lowering intellectual predilections, and therefore suitable mental pabulum for times of mingled decadence and barbarism, and also for the following periods of medieval re-emergence which continued to hark back to the obvious and the easy.

Instead of transmitters, a word indicating function, one might call these men *intermediaries*, and so indicate their position as well as rôle. Both words, however, should be taken relatively. For all the Fathers heretofore considered were in some sense transmitters or intermediaries, even though creative in their work of systematizing, adding to, or otherwise transforming their matter. Yet one would not dub Augustine a transmitter, because he was far more of a remaker or creator. But a dark refashioner indeed will Gregory the Great appear; while Boethius, Cassiodorus, Isidore are rather sheer transmitters, or intermediaries, the last-named worthy destined to be the most popular of them all, through his unerring faculty of selecting for his compilations the foolish and the flat.

8. The Decline of the Older Greek and Roman Paganism and the Rise of the Emotional Mystery Cults—What cultural historians regard as the most important psychological change which took place during classical paganism came during the first centuries of the Christian era. It consisted in the transformation of the religious disposition of the Roman Empire.[26] The old stereotyped and relatively unemotional and non-individualized religion of the early agricultural Republic gradually lost its vitality and died out in the face of the competition of the newly discovered oriental cults which the Roman legions and sailors were bringing back with them to Italy. These new mysteries—that of the Great Mother Goddess of Phrygia, that of the Invincible Sun of Syria, the Egyptian cult of Isis and Serapis, and the Persian mystery of Mithra—were designed to play upon the emotions of the individual, bringing a consciousness of sin, a desire for salvation and purification, and a promise of eternal life in a future world. They prepared the way for the emotionalism and otherworldliness of Christianity, both of which were highly destructive of the calm imperturbability and mundane interests of the natural scientist.[27] Particularly significant is the fact that these oriental mysteries captured the learned classes as well as the masses, while the great minds of earlier paganism had remained for the most part sceptical of the older state religion and popular cults. Franz Cumont, the most eminent authority upon this phase of classical history, thus describes this great religious transformation which was to be carried further by Christianity, itself regarded by contemporaries as but one more mystery cult:[28]

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[26] W. Warde Fowler, "The Religious Experience of the Roman People," "Lectures XVII-XIX; F. Cumont, "Oriental Religions in Roman Paganism," Chap. II, and "The Mysteries of Mithra."

[27] Cumont, "Oriental Religions," *passim.*

> In very early times Greece—later imitated by Rome—became resolutely rationalistic; her greatest originality lies here. Her philosophy was purely laical; thought was unrestrained by any sacred tradition; it even pretended to pass judgment upon these traditions and condemned or approved of them. Being sometimes hostile, sometimes indifferent and sometimes conciliatory, it always remained independent of faith. But while Greece thus freed herself from the fetters of a superannuated mythology, and openly and boldly constructed those systems of metaphysics by means of which she claimed to solve the enigmas of the universe, her religion lost its vitality and dried up because it lacked the strengthening nourishment of reflection. It became a thing devoid of sense, whose *raison d'être* was no longer understood; it embodied dead ideas and an obsolete conception of the world. In Greece as well as at Rome it was reduced to a collection of unintelligible rites, scrupulously and mechanically reproduced without addition or omission because they had been practised by the ancestors of long ago, and formulas hallowed by the *mos maiorum*, that were no longer understood or sincerely cherished. Never did a people of advanced culture have a more infantile religion. . . .
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> To recapitulate, the Oriental religions acted upon the senses, the intellect and the conscience at the same time, and therefore gained a hold on the entire man. Compared with the ancient creeds, they appear to have offered greater beauty of ritual, greater truth of doctrine and a far superior morality. The imposing ceremonial of their festivities and the alternating pomp and sensuality, gloom and exaltation of their services appealed especially to the simple and the humble, while the progressive revelation of ancient wisdom, inherited from the old and distant Orient, captivated the cultured mind. The emotions excited by these religions and the consolations offered strongly attracted the women, who were the most fervent and generous followers and the most passionate propagandists of the religions of Isis and Cybele. Mithra was worshipped almost exclusively by men, whom he subjected to a rigid moral discipline. Thus souls were gained by the promise of spiritual purification and the prospect of eternal happiness.
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> The worship of the Roman gods was a civic duty, the worship of the foreign gods the expression of a personal belief. The latter were the objects of the thoughts, feelings and intimate aspirations of the individual, not merely of the traditional and, one might say, functional adoration, of the citizen. The ancient municipal devotions were connected with a number of earthly interests that helped to support each other. They were one of various forms of family spirit and patriotism and guaranteed the prosperity of the community. The Oriental mysteries, directing the will toward an ideal goal and exalting the inner spirit, were less mindful of economic utility, but they could produce that vibration of the moral being that caused emotions, stronger than any rational faculty, to gush forth from the depths of the soul. Through a sudden illumination they furnished the intuition of a spiritual life whose intensity made all material happiness appear insipid and contemptible. This stirring appeal of supernatural life made the propaganda irresistible. The same ardent enthusiasm guaranteed at the same time the uncontested domination of neo-Platonism among the philosophers. Antiquity expired and a new era was born.

9. The Rise of Pagan Diabolism and Eschatology—Growing in large part out of the acceptance of these Oriental mystery cults, particularly out of Mithraism and the Persian influences, was the development of a belief in cosmic dualism, diabolism and eschatology and the growth of a dominating interest in "last things."[29] The distinction between good and evil spirits and a belief in their interference in human affairs has been common among all peoples where the scientific spirit has not gained ascendency, but the idea of the universe as an arena specifically created for the struggle between the principles and personified powers of good and evil was a concept which came to the classical world from the Persian tradition of the duel of Ormuzd and Ahriman. This notion not only prepared the way for the development of the sordid Christian diabolism, but was the actual historical source of the derivation of this belief.[30] As Cumont says:[31]

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[28] *Ibid.*, p. 31, 43-5.

> In his treatise against the magi, Theodore of Mopsuestia speaks of Ahriman as Satan. At first sight there really is a surprising resemblance between the two. Both are heads of a numerous army of demons; both are spirits of error and falsehood, princes of darkness, tempters and corrupters. An almost identical picture of the pair could be drawn, and in fact they are practically the same figure under different names. It is generally admitted that Judaism took the notion of an adversary of God from the Mazdeans along with portions of their dualism. It was therefore natural that Jewish doctrine, of which Christianity is heir, should have been closely allied to the mysteries of Mithra. A considerable part of the more or less orthodox beliefs and visions that gave the Middle Ages their nightmare of hell and the devil thus came from Persia by two channels: on the one hand Judeo-Christian literature, both canonical and apocryphal; and on the other, the remnants of the Mithra cult and the various sects of Manicheism that continued to preach the old Persian doctrines on the antagonism between the two world principles.

Intimately related to this was the Persian belief in a final cataclysmic close of this cosmic duel, the discomforting of Ahriman and the powers of darkness, the destruction of his followers, and the eternal bliss of the faithful who had chosen to support Ormuzd and had aided their saviour, Mithra. The Greeks and Romans had possessed no very clear or vital conception of immortality and had not taken any conspicuous interest in "last things," but, with the wide-spread acceptance of the Persian eschatology, the attention of men became more and more directed towards preparation for death rather than for life, and towards the assurance of immortal existence rather than towards the concern with the affairs of this world.[32] This culminated in the Patristic attitude, best reflected in Augustine's "City of God," in which earthly existence was pictured as but an ephemeral and inferior experience, designed solely to test fitness for entry into the blessed immortality of the elect in the City of God. For such as espoused these beliefs, science had less than any attraction.

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[29] R. H. Charles, "A Critical History of the Doctrine of a Future Life."

[30] A. Reville, "The Devil: His Origin, Greatness and Decadence."

[31] Cumont, "Oriental Religions," p. 153-4.

[32] Charles, *op. cit.*; Cumont, Chaps. II, VI, VIII.

III. The More Important Aspects of the Christian or Patristic Cultural Tradition Which Made Impossible the Flourishing of Natural Science

1. Syncretic Nature of Christianity—The obstruction of scientific development by orthodox theological notions is a matter which is common knowledge among historians and scientists, owing to the remarkable exposition of the subject by J. W. Draper, Andrew D. White, J. M. Robertson, J. B. Bury and others, and calls for nothing more than a brief summary in this paper.

Both critics and apologists of Christianity have usually erred in analyzing the influence of Christianity upon the culture of the later Roman Empire and the Middle Ages. Sceptical and critical students have normally assigned to Christianity full responsibility for the intellectual and cultural degradation of the first millennium of the Christian era. Christian apologists, on the other hand, have been wont to follow Orosius in picturing the pagan past as one of umixed sin, misery, corruption and ignorance, and in representing Christianity as having introduced an altogether new and higher form of moral and intellectual life. If the above discussion of the decline of pagan learning has demonstrated anything, it must have made it clear that, without any Christian influences whatever, the cultural conditions of the later classical period would have effectively stifled all or most productive scientific effort. On the other hand, it is equally clear that Christianity did not help matters at all, but rather contributed to the pre-existing tendencies towards intellectual degradation. It added relatively little which was new to the intellectual tendencies of the times, but was chiefly a synthesis of the culture of the period. As Professor Robinson has well described the facts in the case: "It has been the habit of Christian apologists to contrast Christianity, pure and undefiled, with an unspeakable 'paganism' or idol worship. Historical Christianity now appears to the modern student of comparative religion to have been the highly complex result of a long development, and to resemble in certain important respects a number of world religions—Stoicism, Hellenistic paganism, Neoplatonism, Mithraism, Manichaeism, Judaism (all of which carried over with them more primitive elements)—with which it found itself in rivalry during the early centuries of its existence. It was the product of religious *syncretism*, a process of unconscious borrowing and lending."[33]

2. Christian Cosmology, Teleology and Eschatology—Perhaps the most significant contribution of Christianity to the anti-scientific movement lay in the general *Weltanschauung* which it wrought out for itself from the many religious and intellectual currents of the Roman Empire. It accepted the Persian view of cosmic dualism—the world as the arena of the contest between good and evil—substituting Yahweh and Christ for Ormuzd and Mithra, and Satan or the Devil for Ahriman, as the leaders of the hosts of righteousness and evil.[34]

This view of cosmology furnished a most significant impulse to the vigorous Christian teleology. There was no event in history and no aspect of natural phenomena which failed to reflect this great cosmic struggle. There was a divine purpose in all creation and all existence. History and "science" were useful only in so far as they aided one in understanding this divine purpose, and in better adapting his personal existence to its fulfilment. As Professor Robinson well says:[35]

> One of the greatest contrasts between medieval thinking and the more critical thought of to-day lies in the general conception of man's relation to the cosmos. To the medieval philosopher, as to the stupidest serf of the time, the world was made for man. All the heavenly bodies revolved about man's abode as their center. All creatures were made to assist or to try man. God and the devil were preoccupied with his fate, for had not God made him in his own image for his glory, and was not the devil intent on populating his own infernal kingdom? It was easy for those who had a poetic turn of mind to think of nature's working as symbols for man's edification. The habits of the lion or the eagle yielded moral lessons or illustrated the divine scheme of salvation. Even the written word was to be valued, not for what it seemed to say, but for hidden allegories depicting man's struggles against evil and cheering him on his way.

Even more than the Persians the Christians were interested in eschatology, which was the Christian analogue or, rather, antithesis, of the modern theory of progress. The creation and existence of the world and the life of all creatures upon it had, as the underlying *rationale* of their existence and the desirable orientation of their activities, the securing of the final triumph of good over evil, the destruction of the Devil and his forces, and the salvation of God's creatures from the fiery torture which awaited the servants of sin after the last great cataclysmic overthrow of Satan and his cohorts. "This was especially true in the Middle Ages," says Professor Robinson. "During these centuries men's single objective was the assurance of heaven and escape from hell. Life was an angry river into which men were cast. Demons were on every hand to drag them down. The only aim could be, with God's help, to reach the celestial shore. There was no time to consider whether the river might be made less dangerous by concerted effort, through the deflection of its torrents and the removal of its sharpest rocks. No one thought that human efforts should be directed to making the lot of humanity progressively better by intelligent reforms in the light of advancing knowledge."[36] This majestic illusion, created by the synthetic capacity of the Patristic mind, and best set forth in Augustine's "City of God," so destructive of any justification of scientific interest in the concrete and fleeting things of this earth, has been most eloquently described by Santayana in his summary of the "Christian Epic":[37]

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[33] J. H. Robinson, "An Outline of the History of the Western European Mind," p. 17. The best available treatments of the syncretic nature of Christianity are F. C. Conybeare, "Myth, Magic and Morals"; T. R. Glover, "The Conflict of Religions in the Roman Empire"; P. Gardner, "Exploratio Evangelica"; and W. R. Cassels, "Supernatural Religion."

[34] M. N. Dhalla, "Zoroastrian Theology," Chaps. XVIII, XXX.

[35] Robinson, "Mind in the Making," p. 142-3.

> There was in the beginning, so runs the Christian story, a great celestial King, wise and good, surrounded by a court of winged musicians and messengers. He had existed from all eternity, but had always intended, when the right moment should come, to create temporal beings, imperfect copies of himself in various degrees. These, of which man was the chief, began their career in the year 4004 B. C., and they would live on an indefinite time, possibly, that chronological symmetry might not be violated, until A. D. 4004. The opening and close of this drama were marked by two magnificent tableaux. In the first, in obedience to the word of God, sun, moon, and stars, and earth with all her plants and animals, assumed their appropriate places, and nature sprang into being with all her laws. The first man was made out of clay, by a special act of God, and the first woman was fashioned from one of his ribs, extracted while he lay in a deep sleep. They were placed in an orchard where they often could see God, its owner, walk in the cool of the evening. He suffered them to range at will and eat of all the fruits he had planted save that of one tree only. But they, incited by a devil, transgressed this single prohibition, and were banished from that paradise with a curse upon their head, the man to live by the sweat of his brow and the woman to bear children in labour. These children possessed from the moment of conception the inordinate natures which their parents had acquired. They were born to sin and to find disorder and death everywhere within and without them.
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> At the same time God, lest the work of his hands should wholly perish, promised to redeem in his good season some of Adam's children and restore them to a natural life. This redemption was to come ultimately through a descendant of Eve, whose foot should bruise the head of the serpent. But it was to be prefigured by many partial and special redemp-

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[36] *Ibid.*, p. 137.

[37] G. Santayana, "The Life of Reason: Reason in Religion," p. 92-7.

tions. Thus, Noah was to be saved from the deluge, Lot from Sodom, Isaac from the sacrifice, Moses from Egypt, the captive Jews from Babylon, and all faithful souls from heathen forgetfulness and idolatry. For a certain tribe had been set apart from the beginning to keep alive the memory of God's judgments and promises, while the rest of mankind, abandoned to its natural depravity, sank deeper and deeper into crimes and vanities. The deluge that came to punish these evils did not avail to cure them. "The world was renewed and the earth rose again above the bosom of the waters, but in this renovation there remained eternally some trace of divine vengeance. Until the deluge all nature had been exceedingly hardy and vigorous, but by that vast flood of water which God had spread out over the earth, and by its long abiding there, all saps were diluted; the air, charged with too dense and heavy a moisture, bred ranker principles of corruption. The early constitution of the universe was weakened, and human life, from stretching as it had formerly done to near a thousand years, grew gradually briefer. Herbs and roots lost their primitive potency and stronger food had to be furnished to man by the flesh of other animals. . . . Death gained upon life and men felt themselves overtaken by a speedier chastisement. As day by day they sank deeper in their wickedness, it was but right they should daily, as it were, stick faster in their woe. The very change in nourishment made manifest their decline and degradation, since as they became feebler they became also more voracious and blood-thirsty."

Henceforth there were two spirits, two parties, or, as Saint Augustine called them, two cities in the world. The City of Satan, whatever its artifices in art, war, or philosophy, was essentially corrupt and impious. Its joy was but a comic mask and its beauty the whitening of a sepulchre. It stood condemned before God and before man's better conscience by its vanity, cruelty, and secret misery, by its ignorance of all that it truly behoved a man to know who was destined to immortality. Lost, as it seemed, within this Babylon, or visible only in its obscure and forgotten purlieus, lived on at the same time the City of God, the society of all the souls God predestined to salvation; a city which, however humble and inconspicuous it might seem on earth, counted its myriad transfigured citizens in heaven, and had its destinies, like its foundations, in eternity. To this City of God, belonged, in the first place, the patriarchs and the prophets who, throughout their plaintive and ardent lives, were faithful to what echoes still remained of a primeval revelation, and waited patiently for the greater revelation to come. To the same city belonged the magi who followed a star till it halted over the stable in Bethlehem; Simeon, who divined the present salvation of Israel; John the Baptist, who bore witness to the same and made straight its path; and Peter, to whom not flesh and blood, but the spirit of the Father in heaven, revealed the Lord's divinity. For salvation had indeed come with the fulness of time, not, as the carnal Jews had imagined it, in the form of an earthly restoration, but through the incarnation of the Son of God in the Virgin Mary, his death upon a cross, his descent into hell, and his resurrection at the third day according to the Scriptures. To the same city belonged finally all those who, believing in the reality and efficacy of Christ's mission, relied on his merits and followed his commandment of unearthly love.

All history was henceforth essentially nothing but the conflict between these two cities; two moralities, one natural, the other supernatural; two philosophies, one rational, the other revealed; two beauties, one corporeal, the other spiritual; two glories, one temporal, the other eternal; two institutions, one the world, the other the Church. These, whatever, their momentary alliances or compromises, were radically opposed and fundamentally alien to one another. Their conflict was to fill the ages until, when wheat and tares had long flourished together and exhausted between them the earth for whose substance they struggled, the harvest should come; the terrible day of reckoning when those who had believed the things of religion to be imaginary would behold with dismay the Lord visibly coming down through the clouds of heaven, the angels blowing their alarming trumpets, all generations of the dead rising from their graves, and judgment without appeal passed on every man, to the edification of the universal company and his own unspeakable joy or confusion. Whereupon the blessed would enter eternal bliss with God their master and the wicked everlasting torments with the devil whom they served.

The drama of history was thus to close upon a second tableau: long-robed and beatified cohorts passing above, amid various psalmodies, into an infinite luminous space, while below the damned, howling, writhing, and half transformed into loathsome beasts, should be engulfed in a fiery furnace. The two cities, always opposite in essence, should thus be finally divided in existence, each bearing its natural fruits and manifesting its true nature.

This synthesis of the Patristic view was doubly deadly to science on account of the authoritative way in which it was inculcated for a thousand years. Professor Robinson says:[38]

This general account of man, his origin and fate, embraced in the Christian Epic, was notable for its precision, its divine authenticity, and the obstacles which its authority consequently presented to any revision in the light of increasing knowledge. The fundamental truths in regard to man were assumed to be established once and for all. The Greek thinkers had had little in the way of authority on which to build, and no inconsiderable number of them frankly confessed that they did not believe that such a thing could exist for the thoroughly sophisticated intelligence. But medieval philosophy and science *were grounded wholly in authority*. The medieval schoolmen turned aside from the hard path of skepticism, long searchings and investigation of actual phenomena, and confidently believed that they could find truth by the easy way of revelation and the elaboration of unquestioned dogmas.

This reliance on authority is a fundamental primitive trait. We have inherited it not only from our medieval forefathers, but, like them and through them, from long generations of prehistoric men. We all have a natural tendency to rely upon established beliefs and fixed institutions. This is an expression of our spontaneous confidence in everything that comes to us in an unquestioned form. As children we are subject to authority and cannot escape the control of existing opinion. We unconsciously absorb our ideas and views from the group in which we happen to live. What we see about us, what we are told, and what we read has to be received at its face value so long as there are no conflicts to arouse skepticism.

We are tremendously suggestible. Our mechanism is much better adapted to credulity than to questioning. All of us *believe* nearly all the time. Few doubt, and only now and then. The past exercises an almost irresistible fascination over us. As children we learn to look up to the old, and when we grow up we do not permit our poignant realization of elderly incapacity among our contemporaries to rouse suspicions of Moses, Isaiah, Confucius, or Aristotle. Their sayings come to us unquestioned; their remoteness makes inquiry into their competence impossible. We readily assume that they had sources of information and wisdom superior to the prophets of our own day.

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[38] Robinson, "Mind in the Making," p. 126-8.

3. Asceticism and the Emphasis upon Withdrawal from Worldly Occupations and Mundane Interests—In view of the Patristic emphasis on the supreme importance of securing entry on a favorable basis into the world to come, and the related warning against absorption with mundane matters, it is not surprising that a large group of Christians in the early Middle Ages separated themselves from the majority of mankind and devoted themselves entirely, in theory at least, to spiritual exercises, which they believed would insure their certain salvation.[39] While this precaution seems rather superfluous, in view of the prevailing dogmas as to the efficacy of the sacramental scheme of salvation, yet the popularity of the monastic life is not to be wondered at in the light of the philosophy of life which dominated the Patristic period. Withdrawal from the world was certainly additional insurance against its seductions. The intensity of the emotional complex which prompted the ascetic career can be discerned in the following citation from Saint Jerome's exhortation to escape the dangerous attractions of earthly cares and joys and to enter upon the holy life of the monk:[40]

> Though your little nephew twine his arms around your neck; though your mother, with disheveled hair and tearing her robe asunder, point to the breast with which she nourished you; though your father fall down on the threshold before you, pass on over your father's body. Fly with tearful eyes to the banner of the cross. In this matter cruelty is the only piety. . . . Your widowed sister may throw her gentle arms around you. . . . Your father may implore you to wait but a short time to bury those near to you, who will soon be no more. Your weeping mother may recall your childish days, and may point to her shrunken breast and to her wrinkled brow. Those around you may tell you that all the household rests upon you. Such chains as these the love of God and the fear of hell can easily break. You say that Scripture orders you to obey your parents, but he who loves them more than Christ loses his soul. The enemy brandishes a sword to slay me. Shall I think of a mother's tears?
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> (When once his friend has cast off the responsibilities of the world he will discover that the desert is full of attractions.) O solitude, whence are brought the stones of the city of the Great King! O wilderness rejoicing close to God! What would you, brother, in the world,—you that are greater than the world? How long are the shades of roofs to oppress you? How long the dungeon of a city's smoke? Believe me, I see more of light! How refreshing to cast off the things that oppress the body and fly away into the pure sparkling ether!
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> Do you fear poverty? Christ called the poor "blessed." Are you terrified at labor? No athlete without sweat is crowned. Do you think of food? Faith fears not hunger. Do you dread the naked ground for limbs consumed with fasts? The Lord lies with you. Does the thought of unkempt locks disturb you? Your head is Christ. Does the infinite vastness of the desert affright you? In the mind walk abroad in Paradise.

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[39] Taylor, "Classical Heritage of the Middle Ages," Chap. VII.
[40] Robinson, "Readings in European History," Vol. I, p. 86-7.

> So often as you do this there will be no desert. Does your skin roughen without baths? Who is once washed in Christ needs not to wash again. In a word, hear the apostle as he answers: "The sufferings of the present time are not worthy to be compared with the glory which shall be revealed in us!" You are too pleasure-loving, brother, if you wish to rejoice in this world and hereafter to reign with Christ!

Some have contended that the monastic life was an impulse to scientific activity and have pointed to the example of scientific achievements by monks from the time of Albertus Magnus and Roger Bacon to Gregor Mendel, but it must not be forgotten that the scholarly and scientific activities of the monks were incidental to their avowed concentration on spiritual matters. Indeed, one may go further and say that all the scientific activity they carried on was consciously or unconsciously a complete negation of the basic justification of the monastic career. As a matter of fact according to the authoritative opinion of Augustine, all science and secular learning, past and present, belonged essentially to the City of the Devil.

4. Allegory, Symbolism and Vagueness of Expression—Allegory and symbolism were no innovation of Christianity. They were present in both Oriental and Classical thought, particularly in Hellenistic Judaism and in Neoplatonism.[41] But Christianity supplied additional impulses. With the acceptance of the orthodox view of the literal inspiration and complete harmony of the Scriptures, it became necessary to resort to allegorical interpretation in order to explain away obvious discrepancies, to excuse incidents of conduct not appropriate in the chosen servants of God, and to interpret literal impossibilities. Another impulse came from teleology and eschatology. If all incidents or events were linked together as a part of the majestic scheme of universal orientation and purpose, one should seek in all things, particularly in the Scriptures, a deeper and loftier meaning than that which appears in the literal sense of the passage.[42] The most effective exponent of the allegorical method was the great Alexandrian Father, Origen. Shotwell and Conybeare have well stated Origen's justification of this procedure:

> Interpretation of the scriptures by allegory is not, in Origen's eyes, an unwarranted liberty. The scriptures themselves sanction it—allegorically! "There is a hidden and secret meaning," he says, "in each individual word. The treasure of divine wisdom is hid in the vulgar and unpolished vessels of words; as the apostle also points out when he says, 'We have this treasure in earthen vessels.'" Quaintly naïve as such reasoning seems when based upon a single text, its weakness becomes its

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[41] Taylor, "Classical Heritage of the Middle Ages," p. 90 ff.

[42] Taylor, "Medieval Mind," Vol. II, Chap. XXVIII.

strength when sufficient texts are adduced, to convey the impression that the scriptures themselves do really proclaim their own symbolic character. This Origen endeavors to do. "If the texts of Moses had contained nothing which was to be understood as having a secret meaning, the prophet would not have said in his prayer to God: 'Open thou mine eyes and I will behold wondrous things out of thy law (Psalms, 119-18).'" What, he asks, can one make out of the prophecy of Ezekiel except allegorically? Prophetic literature implies allegory in its very structure. But the strongest proof of the legitimacy of allegorical interpretation is its use in the New Testament, and so largely by St. Paul.[43]

Wherever, Origen argues, we meet with such useless, nay impossible, incidents and precepts as these, we must discard a literal interpretation and consider of what moral interpretation they are capable, with what higher and mysterious meaning they are fraught, what deeper truths they were intended symbolically and in allegory to shadow forth. The divine wisdom has of set purpose contrived these little traps and stumbling-blocks in order to cry halt to our slavish historical understanding of the text, by inserting in its midst sundry things that are impossible and unsuitable. The Holy Spirit so waylays us in order that we may be driven by passages which taken in their *primafacie* sense cannot be true or useful, to search for the ulterior truth, and seek in the Scriptures which we believe to be inspired by God a meaning worthy of Him.[44]

The absurdities of the allegorical method and symbolism, and the vast gulf which separates them from the scientific procedure can, perhaps, best be illustrated by two typical passages, one from the Epistle of Barnabas and the other from Gregory the Great's "Moralia" or commentary on the Book of Job:

Now what do you suppose this to be a type of, that a command was given to Israel, that men of the greatest wickedness should offer a heifer, and slay and burn it, and that then boys should take the ashes, and put these into vessels, and bind round a stick purple wool along with hyssop, and that thus the boys should sprinkle the people, one by one, in order that they might be purified from their sins? Consider how He speaks to you with simplicity. The calf is Jesus: the sinful men offering it are those who lead Him to the slaughter. But now the men are no longer guilty, are no longer regarded as sinners. And the boys that sprinkle are those that have proclaimed to us the remission of sins and purification of heart. To these He gave the authority to preach the gospel, being twelve in number, corresponding to the twelve tribes of Israel. But why are there three boys that sprinkle? To correspond to Abraham, and Isaac, and Jacob, because these were great with God. And why was the wool (placed) upon the wood? Because by wood Jesus holds His kingdom, so that (through the cross) those believing on Him shall live for ever. But why was hyssop joined with the wool? Because in His kingdom the days will be evil and polluted in which we shall be saved, (and) because he who suffers in body is cured through the cleansing efficacy of hyssop. And on this account the things which stand thus are clear to us, but obscure to them, because they did not hear the voice of the Lord.[45]

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[43] J. T. Shotwell, in *Journal of Philosophy, Psychology and Scientific Methods*, February 26, 1920, p. 115-6.

[44] F. C. Conybeare, "A History of New Testament Criticism," p. 14-5.

[45] The Epistle of Barnabas, in "Apostolic Fathers," Ante-Nicene Christian Library, Vol. I, p. 114-5.

(The manner of this allegorical interpretation, so popular throughout the Middle Ages, may be illustrated by Gregory's commentary on the statement that Job possessed, among other property, "five hundred yoke of oxen and five hundred she asses.")

We have said above that by the number fifty, which is completed by seven weeks and the addition of an unit, rest is signified, and by the number ten the sum of perfection is set forth. Now, forasmuch as the perfection of rest is promised to the faithful, by multiplying fifty ten times, we arrive at five hundred. But in Sacred Writ the title of oxen sometimes represents the dullness of the foolish sort, and sometimes the life of well-doers. For because the stupidity of the fool is represented by the title of an ox, Solomon says rightly, "He goeth after her straightway, as an ox goeth to the slaughter." Again, that the life of every laborer is set forth by the title of oxen, the precepts of the Law are a testimony, which enjoined through Moses, "Thou shalt not muzzle the ox when he treadeth out the corn." And this again is declared in plain words, "The labourer is worthy of his hire."

By the title of asses, too, we have represented sometimes the unrestrained indulgence of the wanton, sometimes the simple-mindedness of the Gentiles; for the inertness of fools is imaged by the designation of asses, as where it is said through Moses, "Thou shalt not plough with an ox and an ass together." As though he said, "Do not associate fools and wise men together in preaching, lest by means of him who has no power to accomplish the work you hinder him who has abundant power." The unrestrained indulgence of the wanton is likewise set forth by the appellation of asses, as the prophet testifies when he says, "whose flesh is as the flesh of asses."

Again, by the title asses is shown the simplicity of the Gentiles. Hence, when the Lord went up to Jerusalem, he is related to have sat upon a young ass. For what is it for him to come to Jerusalem sitting upon an ass, except taking possession of the simple hearts of the Gentiles to conduct them to the vision of peace, by ruling and ordering them? And this is shown by one passage, and that a very easy one, in that both the workmen of Judea are represented by oxen, and the Gentile peoples by an ass, when it is said by the prophet, "The ox knoweth his owner, and the ass his master's crib." For who appears as the ox saving the Jewish people, whose neck was worn by the yoke of the Law? And who was the ass but the Gentile world, which was like a brute animal readily seduced by every deceiver, for he did not resist by exercise of reason?[46]

This development of allegory and symbolism was not only obstructive of the general attitude of scientific endeavor, it even colored the content of the pseudo-science of the period. Stones, plants and animals were supposed to possess magic qualities and symbolically to shadow forth divine verities or spiritual values.[47] "Natural science," says Professor Robinson, "like history, was only valuable as illustrating God's ways to man. Magic was useful to foretell the future, heal the sick, and to make gold."[48] The following citation from Mr. Taylor's paraphrase of a section of the "Physiologus," a much used work on natural history during the Patristic period, will constitute a sufficient illustration of the so-called "theistic biology" so characteristic of the prevailing symbolism of all branches of Patristic "science":[49]

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[46] Selection from the "Moralia" in Robinson, "Readings in European History," Vol. I, p. 79-80.

[47] L. Thorndike, "The Place of Magic in the Intellectual History of Europe."

[48] J. H. Robinson, "History of the Western European Mind," p. 25.

> Well known as these stories are, one or two examples may be given to recall their character: The Lion has three characteristics; as he walks or runs he brushes his foot-prints with his tail, so that the hunters may not track him. This signifies the secrecy of the Incarnation—of the Lion of the tribe of Judah. Secondly, the Lion sleeps with his eyes open; so slept the body of Christ upon the Cross, while His Godhead watched at the right hand of the Father. Thirdly, the Lioness brings forth her cub dead; on the third day the father comes and roars in its face, and wakes it to life. This signifies the Lord's resurrection on the third day.
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> The Pelican is distinguished by its love for its young. As these begin to grow they strike at their parents' faces, and the parents strike back and kill them. Then the parents take pity, and on the third day the mother comes and opens her side and lets the blood flow on the dead young ones, and they become alive again. Thus God cast off mankind after the Fall, and delivered them over to death; but He took pity on us, as a mother, for by the Crucifixion He awoke us with His blood to eternal life.
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> The Unicorn cannot be taken by hunters, because of his great strength, but lets himself be captured by a pure virgin. So Christ, mightier than the heavenly powers, took on humanity in a virgin's womb.
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> The Phoenix lives in India, and when five hundred years old fills his wings with fragrant herbs and flies to Heliopolis, where he commits himself to the flames in the Temple of the Sun. From his ashes comes a worm, which the second day becomes a fledgling, and on the third a full-grown phoenix, who flies away to his old dwelling-place. The Phoenix is the symbol of Christ; the two wings filled with sweet-smelling herbs are the Old and New Testaments, full of divine teaching.

Another expedient of the Patristic mind in evading the concrete direct and specific methods of science was the realization of the "resources of vagueness of expression" in matters of dialectic and of doctrinal exegesis. Augustine clearly sets forth his appreciation of the possible virtue of ambiguity in his "Confessions," where he says, "I assuredly,—and this I assert without apprehension and from the bottom of my heart,—if I were writing something of most unquestioned credibility, should prefer so to write that my words should convey whatever truth concerning the things in question any person might be able to compass, rather than to write in such a fashion that I should express a single true idea with such a degree of clarity that I should exclude all other ideas the falsity of which would not be able to trouble me."[50]

5. The Flourishing of the Miraculous and the Notion of a "God of Arbitrariness"—The phase of Patristic learning which was probably the most directly opposed to the scientific point of view was the all-pervading belief in miracles and supernatural intervention. As Christianity itself was founded essentially upon a complex of alleged miraculous occurrences, it was but natural that the Christian Fathers should expect a continuance of these miraculous acts. To be sure, the pagan thinkers, particularly the Neoplatonists, had contended that divine action was essentially miraculous, but the Christians developed the lust for the miraculous much farther than the Neoplatonists. The miraculous was the surest proof of divine intervention in the interests of the faithful and to the embarrassment or discomfort of the Devil and his sinful followers. But the Devil himself was also prolific in miraculous acts, and it was often difficult for the good Christian of the Middle Ages to be certain whether God or the Devil had performed the miracle in question. Taylor has well summed this Patristic enthusiasm for miracle mongering:[51]

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[49] Taylor, "The Medieval Mind," Vol. I, p. 76-7.

[50] Augustine, "Confessions," XII, 31.

> Here are fundamental principles of patristic faith. The will of God is the one cause of all things. It is unsearchable. But we have been taught much regarding God's love and compassionateness, and of His desire to edify and save His people. These qualities prompt His actions towards them. Therefore we may expect His acts to evince edifying and saving purpose. All the narratives of Scripture are for our edification. How many mighty saving acts do they record, from the Creation, onward through the story of Israel, to the birth and resurrection of Christ! And surely God still cares for His people. Nor is there any reason to suppose that He has ceased to edify and save them through signs and wonders. Shall we not still look for miracles from His grace?
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> Thus in the nature of Christianity, as a miraculously founded and revealed religion, lay the ground for expecting miracles, or, at least, for not deeming them unlikely to occur. And to the same result from all sides conspired the influences which had been obscuring natural knowledge. We have followed those influences in pagan circles from Plato on through Neo-Platonism and other systems current in the first centuries of the Christian era. We have seen them obliterate rational conceptions of nature's processes and destroy the interest that impels to unbiassed investigation. The character and exigencies of the Faith intensified the operation of like tendencies among Christians. Their eyes were lifted from the earth. They were not concerned with its transitory things, soon to be consumed. Their hope was fixed in the assurance of their Faith; their minds were set upon its confirmation. They and their Faith seemed to have no use for a knowledge of earth's phenomena save as bearing illustrative or confirmatory testimony to the truth of Scripture. Moreover, the militant exigencies of their situation made them set excessive store on the miraculous foundation and continuing confirmation of their religion.

This absorption in the expectancy and contemplation of the miraculous also reflected the Christian idea of God and the mode of his manifestation in nature. Since the days of the Deists we have come to conceive of God as manifesting himself, if he does so at all, in the orderly workings of nature.[52]

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[51] Taylor, "Medieval Mind," Vol. I, p. 74-5.

[52] A. C. McGiffert, "Protestant Thought since Kant," Chap. X.

Natural law and divine law have been assimilated, and no one of a scientific turn of mind expects or wishes any deviation from the norm of nature. But in the Patristic period God was expected to express himself primarily through aberrations and eccentricities in nature—the great prototype of which was the stopping of the sun in the interest of Joshua's military strategy. This Christian conception of God has been called by Harnack the belief in the "God of arbitrariness." Professor Robinson has well described this conventional Patristic attitude towards God:[53]

> The medieval Christian was essentially more polytheistic than his pagan predecessors, for he pictured hierarchies of good and evil spirits who were ever aiding him to reach heaven or seducing him into the paths of sin and error. Miracles were of common occurrence and might be attributed either to God or the devil; the direct intervention of both good and evil spirits played a conspicuous part in the explanation of daily acts and motives.
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> As a distinguished church historian has said, the God of the Middle Ages was a God of arbitrariness—the more arbitrary the more Godlike. By frequent interferences with the regular course of events he made his existence clear, reassured his children of his continued solicitude, and frustrated the plots of the Evil One. Not until the eighteenth century did any considerable number of thinkers revolt against this conception of the Deity and come to worship a God of orderliness who abode by his own laws.

Closely related to the Patristic and medieval conception of the "God of arbitrariness" was the parallel view of the imminence and ubiquity of the Devil. Indeed, the activities of man and nature both were held to be but the resultant of the ever varying pressure of forces exerted either by God or the Devil. This was the whole basis of psychic causation in medieval psychology. M. Réville has well stated this paralyzing medieval belief in the omnipresence, activity and ingenuity of the Devil:[54]

> The absorbing nature of the belief in the devil during the middle ages is the point we wish to make clear. Those who have still this faith can hardly imagine to what a degree it then controlled men's whole lives. It was the one fixed idea with every one. A fixed idea tends, among those whom it possesses, to center everything in itself. When, at the present day, we observe closely those of our contemporaries who devote themselves to spiritualism, it is surprising to see how fertile their imagination becomes when they are busy in interpreting, in favour of their hobby, the most trifling and unimportant circumstances. The unlatching of a half-closed door, an insect describing arabesques in its flight, the fall of a badly-balanced article, the creaking of furniture at night-time, any of these petty accidents suffices to give wing to their fancy. If we generalize such a mental state, by substituting faith in the incessant interventions of the devil for the harmless illusions of our spiritualists, we shall get a fair notion of what took place in the middle ages.

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[53] Robinson, "Mind in the Making," p. 124-5.

[54] A. Réville, "The Devil, His Origin, Greatness and Decadence," p. 37-8.

6. The Repression of Heresy and the Machinery for Enforcing Acquiescence in Authority and Crushing Independent Thought—With the growth of Christianity there inevitably developed many different notions as to the nature of Christianity. There were widely divergent beliefs as to the nature of Christ, the purpose of his ministry, and the character and results of the Christian life. It soon became evident to the leaders of the Christian cult that some method must be found for checking this diversity or Christianity would be split into many irreconcilable sects and would perish from internal divisions in the face of imperial persecution and the competition of contemporary religions. By the middle of the second century we find the writers of Jude and Second Peter denouncing the heretics in exceedingly intemperate language, and a century later St. Cyprian set forth his famous dogma that outside of the one Catholic Church there was no salvation for any one, be his moral life as pure as that of St. Anthony and his impurity complex as highly developed as that of Anthony Comstock.[55] Within another century the Church had won over the Roman Empire to its side, and it was not long before imperial legislation in the Theodosian Code of 438 was directed towards enforcing obedience and conformity to accepted Christian doctrine. A man might suffer death if he failed to accept the view of the Trinity expounded by Damasus of Rome or Peter of Alexandria.[56] Heresy remained a capital crime for some twelve hundred years. As Christian dogma and the Christian Epic were almost wholly anti-scientific, and as deviation from this accepted body of knowledge was as hazardous as it was unlikely, it can readily be seen that science had little opportunity to exist, had other circumstances been favorable. It was not long after Cyprian until it was veritably true that "reason was in prison." Professor Robinson has admirably described this Christian intolerance and the psychological and historical basis from which it developed:[57]

> The Christian Epic did not have to rely for its perpetuation either on its intellectual plausibility or its traditional authority. During the Middle Ages there developed a vast and powerful religious State, the medieval Church, the real successor, as Hobbes pointed out, to the Roman Empire; and the Church with all its resources, including its control over "the secular arm" of kings and princes, was ready to defend the Christian beliefs against question and revision. To doubt the teachings of the Church was the supreme crime; it was treason against God himself, in comparison with which—to judge from medieval experts on heresy—murder was a minor offense.

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[55] See Robinson, "Readings in European History," Vol. I, p. 19-21.

[56] *Ibid.*, p. 21-7.

[57] Robinson, "Mind in the Making," p. 131-3.

We do not, however, inherit our present disposition to intolerance solely from the Middle Ages. As animals and children and savages, we are naïvely and unquestioningly intolerant. All divergence from the customary is suspicious and repugnant. It seems perverse, and readily suggests evil intentions. Indeed, so natural and spontaneous is intolerance that the question of freedom of speech and writing scarcely became a real issue before the seventeenth century. We have seen that some of the Greek thinkers were banished, or even executed, for their new ideas. The Roman officials, as well as the populace, pestered the early Christians, not so much for the substance of their views, as because they were puritanical, refused the routine reverence to the gods, and prophesied the downfall of the State.

But with the firm establishment of Christianity edicts began to be issued by the Roman emperors making orthodox Christian belief the test of good citizenship. One who disagreed with the emperor and his religious advisers in regard to the relation of the three members of the Trinity was subject to prosecution. Heretical books were burned, the houses of heretics destroyed. So, organized medieval religious intolerance was, like so many other things, a heritage of the later Roman Empire, and was duly sanctioned in both the Theodosian and Justinian Codes. It was, however, with the Inquisition, beginning in the thirteenth century, that the intolerance of the Middle Ages reached its most perfect organization.

Heresy was looked upon as a contagious disease that must be checked at all costs. It did not matter that the heretic usually led a conspicuously blameless life, that he was arduous, did not swear, was emaciated with fasting and refused to participate in the vain recreations of his fellows. He was, indeed, overserious and took his religion too hard. This offensive parading as an angel of light was explained as the devil's camouflage. No one tried to find out what the heretic really thought or what were the merits of his divergent beliefs. Because he insisted on expressing his conception of God in slightly unfamiliar terms, the heretic was often branded as an atheist, just as to-day the Socialist is so often accused of being opposed to all government, when the real objection to him is that he believes in too much government. It was sufficient to classify a suspected heretic as an Albigensian, or Waldensian, or a member of some other heretical sect. There was no use in his trying to explain or justify; it was enough that he diverged.

7. Necessity of an Alteration of Intellectual Attitudes and Interests before a Scientific Revival Could be Possible—The above brief enumeration of the chief phases of pagan and Christian culture, which either discouraged or opposed the scientific point of view, should at least be sufficient to prove that, far from there being no evident reasons for the decline of Hellenistic scientific activity, the real truth is that there was almost every possible cultural reason for the extinction of scientific activity in the early Middle Ages. Before any promising revival of science could be expected it was necessary, as Professor Robinson insists, that there be a fundamental revolution in intellectual attitudes and interests:[58]

> In order that modern science might develop it is clear that a wholly new and opposed set of fundamental convictions had to be substituted

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[58] *Ibid.*, p. 144-5.

for those of the Middle Ages. Man had to cultivate another kind of self-importance and a new and more profound humility. He had to come to believe in his capacity to discover important truth through thoughtful examination of things about him, and he had to recognize, on the other hand, that the world did not seem to be made for him, but that humanity was apparently a curious incident in the universe, and its career a recent episode in cosmic history. He had to acquire a taste for the simplest possible and most thoroughgoing explanation of things. His whole mood had to change and impel him to reduce everything so far as possible to the commonplace.

The process of the dissolution of the Christian Epic and the Patristic tradition was a gradual one to which many forces contributed. In the later Middle Ages there developed an interest in observing the commonplace things of nature, noticeable in the work of Albertus Magnus, Adelard of Bath and Roger Bacon. Bacon also risked at least a mild assault upon the metaphysical scholastic method and upon the régime of authority. The Humanists revived an interest in the secular matters which had attracted the pagan past. Copernicus, Tycho Brahe, Galileo, Kepler and Newton initiated the modern scientific movement by their notable discoveries in the field of astronomy and mechanics. Bruno, Bacon, Descartes and the later Rationalists set forth the philosophic implications of the progress of natural science, as exemplified by the work of Copernicus and his successors. The period of oversea expansion brought in a vast mass of new scientific data and did much to break down the rigidity of the medieval intellectual attitudes and to dissipate the European provincialism of the Middle Ages. Finally, Voltaire and Tom Paine launched a comprehensive attack upon the whole Christian Epic, and Diderot for the first time popularized the new learning. The rule of Augustine and the spell of the Patristic obsession had at last been challenged, if not broken.

IV. Economic, Social and Political Conditions in the Later Roman Empire Which Discouraged Scientific Activity

While science may flourish under adverse conditions in the economic, social and political environment to better advantage than under obstacles in the intellectual environment, it is fostered by conditions of peace, prosperity, order and social flexibility. None of these existed in the society of the later Roman Empire and the Early Middle Ages. Economic conditions became progressively worse. Depending largely upon Gaul and the Orient for its sustenance, Rome developed the psychology and practices of the spendthrift and the parasite. Senseless waste characterized the upper classes and publicly engendered pauperism the proletariat. The provinces were ravaged by administrative grafters, and the sources of imperial revenue were slowly but surely exhausted before the time when they were most needed at the time of Diocletian. The cities became less prosperous and populous, the social basis of Roman imperial civilization slowly shifted back to an agrarian order, in which landownership by great landlords replaced the earlier agricultural era of peasant freeholding. Poverty increased and the cost of living went up, in spite of efforts at government control. The middle class—the backbone of Roman society—were crushed by the burden of taxation which fell upon them with an unjust incidence, and they gradually slipped down into a condition in which they merged with the peasantry in a semi-servile class—the *colonate*.[59] The Roman world became a feudal régime, lacking only the military element, which was to be supplied by Charles Martel and the early Carolingians. In the later Roman Empire there came a great centralization of governmental powers and an increase of political functions, but it was at a time when it was least easy to raise the revenue necessary to support the newly acquired burdens of administration and when the administrators could be most readily ignored by the powerful group of arrogant and plutocratic landlords, who were laying the basis for what was to be the economic, social and political system which prevailed in Europe for a millennium. Anarchy, confusion and disorder grew apace and were powerfully forwarded by the barbarian permeation.[60] Not until the ninth century were conditions even partially stabilized, and the twelfth century marks the first emergence of an era which, in economic, social and political conditions, was even moderately adapted to forming the environment out of which might develop the preliminary stages of a revival of scientific interest and achievement. Mr. Dill, in his remarkable account of the decline of Roman society, presents the following graphic picture of the economic, social and political disintegration of Roman society which accompanied the decadence of pagan learning and the rise of the Christian Epic:[61]

> We have hitherto been occupied with the condition of Roman society in the West as it is revealed to us in its literary remains. But Symmachus,

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[59] W. L. Westermann, "The Economic Basis of the Decline of Ancient Culture," in *American Historical Review*, July, 1915.

[60] S. Dill, "Roman Society in the Last Century of the Western Empire," Books III-IV.

[61] *Ibid.*, p. 227-9.

Ausonius, Sidonius and their class throw little light on the condition of other classes than their own, or on the deep-seated and inveterate diseases which for generations had been undermining the strength of the imperial system. The general tendency of modern inquiry has been to discover in the fall of that august and magnificent organization, not a cataclysm, precipitated by the impact of barbarous forces, but a process slowly prepared and evolved by internal and economic causes. It is probable that the barbarian invasions of the fifth century were not more formidable than those of the third, which were triumphantly repelled by the Illyrian Caesars, or than those of the fourth, which were rolled back by the genius of Julian and the ferocious energy of Valentinian. The question why the invasions of the fifth century succeeded, while the earlier failed, is best answered by an appeal to the Imperial Code. In the voluminous enactments issued from Constantine to Majorian, the student has before him a melancholy diagnosis of the maladies which, by a slow and inevitable process of decay, were exhausting the strength of Roman society. He will see municipal liberty and self-government dying out, the upper class cut off from the masses by sharp distinctions of wealth and privilege, yet forbidden to bear arms, and deprived of all practical interest in public affairs. He will find that not only has an Oriental monarchy taken the place of the principate of Augustus, but that an almost Oriental system of caste has made every social grade and every occupation practically hereditary, from the senator to the waterman on the Tiber, or the sentinel at a frontier post; and that human nature is having its revenge in wholesale flight from a cruel servitude and the chaos of administration. It will be seen that in a society in which poverty is almost branded with infamy, poverty is steadily increasing and wealth becoming more insolent and aggressive; that the disinherited, in the face of an omnipotent government, are carrying brigandage even up to the gates of Rome; that parents are selling their children into slavery; that public buildings are falling into decay; that the service on the great post roads is becoming disorganized. At a time when every frontier was threatened, it will be found that the frontier posts are being abandoned, that there is wholesale desertion from the ranks of the army; while in the failure of free recruits, the slaves have to be called to arms. But the unscientific and inefficient financial system will chiefly attract the notice of the historical inquirer. The collection of imposts in kind opened the door to every species of corruption. Still more fatal to pure administration was the system which left to the municipal class the assessment and collection of the revenue in their district. That doomed order are at once branded as the worst oppressors, and invested with the melancholy glory of being the martyrs of a ruinous system of finance. Their lingering fate, recorded in 192 edicts, a tragedy prolonged through more than five generations, is one of the most curious examples of obstinate and purblind legislation, contending hopelessly with inexorable laws of society and human nature. In that contest the middle or bourgeois class was almost extinguished, Roman financial administration was paralyzed, and at its close the real victors and survivors were the great landholders, surrounded by their serfs and dependents. A volume might be written on the corruption and cruel oppression of the officials of the treasury, servile to the great, tyrannical to the poor, and calmly defying all the menaces of the emperor in their unchecked career of rapacity. The last and deepest impression which the inquirer will carry with him, as he rises from a study of the Theodosian Code, is that fraud and greed are everywhere triumphant, that the rich are growing richer and more powerful, while the poor are becoming poorer and more helpless, and that the imperial government, inspired with the best intentions, has lost all control of the vast machine.

It must be remembered, however, that these adverse economic, social and political conditions did not initiate the beginnings of the decline of ancient science. This had started before the passing of the most peaceful and prosperous days of the Roman Empire. Rather, these conditions in the social environment simply helped along the process during the Patristic and early medieval periods, but they were too significant in the era of their influence to be ignored.

PSYCHOANALYSIS OF FREUD AND ADLER
OR
SEX-DETERMINISM AND CHARACTER-FORMATION[1]

By Francis Cecil Sumner

I

The question of sex-determinism is both biological and psychological. The psychological aspect of the problem is of very great import for our knowledge of the variance in human character-type. As finger-prints of not two individuals are exactly alike according to Bertillon, so also not two individuals are completely alike in character or diathesis. This infinity of individual differences signifies that according to the bisexual theory of Fliess (*Zwischenreich*), Halban (*pseudohermaphroditismus secondarius*), and Hirschfeld (*Zwischenstufentheorie*) there are no two individuals in whom the particular fusion of masculinity and femininity exists identical for each. Thus in a dynamic sense, character or diathesis is the particular fusion of masculinity and femininity within the particular individual.

Every individual is a duplex, i. e., both masculine and feminine:—a psychic if not a somatic pseudohermaphrodite. In each bisexual ensemble there is a dominant and a recessive sexuality. It is this dominant sexuality whether masculine or feminine which is more conspicuous in the individuality and which leads common parlance to speak of an individual as male or female, unmindful of the deeper complexity of human nature. That there is no absolute male or female but only approximations thereto involves the formation of a working hypothesis. Thus the relative sex-determinism within the individual character is a matter of the ratio of masculinity to femininity within such a one. This amounts to saying in the form of a law that in man the increase in masculinity is inversely proportional to the decrease in femininity and in woman the increase of femininity is inversely proportional to the decrease in masculinity.

These generalizations already set forth by Otto Weininger ("Sex and Character") lack merely the biological and psychological support which shall herewith be presented. For sake of clearness this evidence may be divided into two categories: 1. The Phylogenetic; 2. The Ontogenetic.

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[1] A dissertation submitted to the faculty of Clark University, Worcester, Mass., in partial fulfilment of the requirements for the degree of Doctor of Philosophy, and accepted on the recommendation of Dr. G. Stanley Hall.

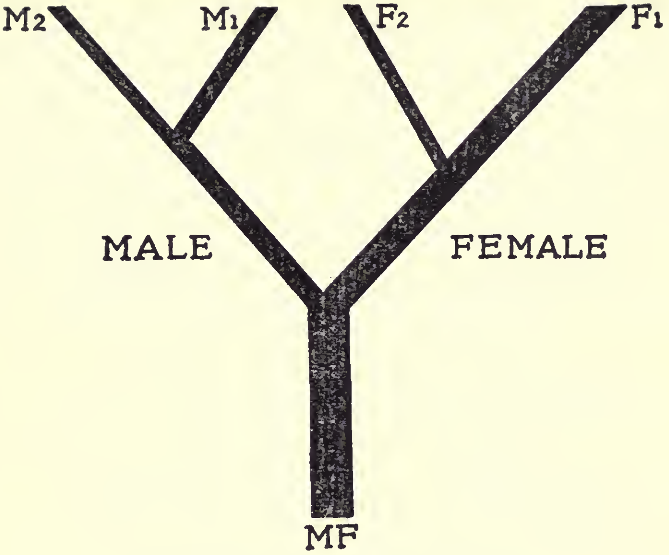
1. The Phylogenetic—When the principle of Mendelian inheritance is applied to the evolution of the two sexes the results are significant for the bisexual theory. The so-called male and female of the species have descended from a remote common ancestor in the micro-organic realm. According to Belfield this far off ancestor of the two sexes while hermaphroditic in the main, nevertheless bore more points of similarity to our so-called female than to our so-called male and for that reason he prefers to indicate femaleness as the dominant Mendelian character; maleness as the recessive Mendelian character. From this primitive common parent of the two sexes were evolved the two lines: one in the masculine direction and one in the feminine direction. The respective goals of these two evolving lines are conceived as approximations to absolute masculinity and absolute femininity. After the two sexes were evolved, i. e., after the division into male and female according to the primary sex-character, there recapitulated in each of the two sexes the evolutionary process which had gone on before in the evolution of the two sexes. The masculine line again differentiates itself into the more masculine as recessive line and into a more feminine as dominant line; the feminine line differentiates itself into the more masculine as recessive line and into a more feminine as dominant line. This secondary differentiation deals with secondary, tertiary, etc., sex-characters. A genealogical tree of the evolution of the sexes based on Mendelian inheritance might here serve to clear up the foregoing.

Thus far have evolved four great bisexual character-types:

1. The males in whom masculinity predominates (M_2).
2. The males in whom femininity predominates (M_1).
3. The females in whom masculinity predominates (F_2).
4. The females in whom femininity predominates (F_1).

It is proper here to insert some of the biological evidence for this genealogy of the sex-types. Belfield claims that as the unicellular organisms or protozoa are the most primitive ancestors of man so also their reproductive life is the evolutionary prototype of present-day reproductive life of the higher animals including man. He with Thomson, Geddes and others trace the reproductive life in the following three stages:

1. Asexual reproduction. At this stage hunger and reproduction, two of the most primitive instincts, were closely bound up in the one micro-organism; and here is found the



HERMAPHRODITIC COMMON ANCESTOR

primitive hermaphroditic *Anlage* of the two sexes, for not yet had two differently sexed organisms appeared and reproduction consisted of parthenogenesis, autofecundation, self-fertilization or cell-cleavage. Such a process is to be seen today in what remains over in certain varieties of shell-fish, female plant lice and in cell-cleavage itself.

2. Bisexual reproduction. Towards the dawn of the metazoa evolved the male-cell and the female-cell within the body of the hermaphroditic parent to be seen today in such extant remains as the earth-worm, the snail and the oyster. Thomson and Geddes assign two major biological reasons for the division into male and female germ-cells: the biological advantage of cross-fertilization; and the greater specialization of the female apparatus. Of this stage Belfield writes: "For in many animal-types there is no male; when he does appear, he is at first merely a parasite upon or within the body of the female."

3. Unisexual reproduction. This stage but continues the evolution of the two germinal sexes begun in the second stage. The male cell evolves in its direction and the female specializes in its direction. For reproduction is requisite the conjugation of male and female organisms.

The general directions of the two evolving lines are: one in the direction of absolute masculinity and the other in the direction of absolute femininity. Many students have arisen to point out the major sex-differences between the masculine and feminine lines of evolution. Among them are of especial note Ellis, Moebius, Bucura, Blair Bell, Heymann, Finot, Moll, Thomson and Geddes. Both Fouillee and Walter Heape compare the male individual to the spermatozoon and the female individual to the ovum. "The male is active and roaming; he hunts for his partner and is an expender of energy; the female is passive, sedentary and is a conservator of energy." Thomson and Geddes diagrammatically summarize the major biopsychic sex-differences thus:

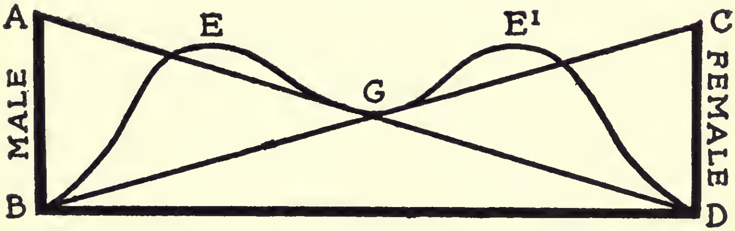
Male	*Female*
Sperm-producer	Egg-producer
With less expensive reproduction	With much more expensive reproduction
More intense metabolism	Less intense metabolism
Relatively more katabolic	Relatively more anabolic
Often with shorter life	Often with longer life
Often more brilliantly colored and more decorative	Often quieter in color and plainer
Rising to more intense outbursts of energy	Capable of more patient endurance
More impetuous and experimental	More persistent and conservative
More divergent from youthful type	Nearer the youthful type
Often more variable	Often less variable
Making more of sex-gratification	Making more of the family
More combative	Consolidating the family

Moebius seeks mainly to indicate the skeletal differences between the sexes and incidentally to dwell upon the roving disposition (*Wanderlust*), aggressivity, of the male in contradistinction to the homing-instinct (*Heimtrieb*), maternal love, tender feeling, dance and music impulses of the female. Weininger refers to the male tendency as the "liberating impulse" while to the female tendency as the "uniting impulse." Adler refers to the male tendency as the aggressive will-to-power, superiority impulse, while to the female tendency as passivity, inferiority impulse. Freud speaks of the feminine tendency as the love impulse while Ellis goes so far as to say, "A man is a man to his very thumbs and a woman is a woman to her little toes." Bucura is not alone when he points out that the female is more emotional, more unconscious, more intuitive, more aesthetic, more infantile.

Suffice it to say that the two evolving lines are diametrically opposite in character or tend in that direction. In cross-fertilization, as is all human reproduction, the male line merges with the female line, i. e., in the germ-cell fusion a recapitulation of the primitive hermaphroditic stage of unicellular organisms and the evolution of the new individual traverses the evolutionary stages of the remote development of the two sexes, the dominant sexuality gaining the ascendency. Not only do the primary sex-characters contend for the mastery but also the secondary, tertiary, etc., sex-characters autonomously do likewise. If the sex-determinant is merely the x-chromosome, there is indeed a great complexity underlying it the nature of which can be gleaned from the following complex study of ontogeny.

2. *The Ontogenetic*—Not only does the Mendelian principle when applied to the phylogeny of the sexes indicate the common ancestry of the two sexes, but also it goes far in explaining the presence of heterologous secondary, tertiary sex-characters in hermaphrodites proper and ordinary human beings or pseudohermaphrodites. The study of hermaphrodites proper reveals in bold relief the presence of heterologous sex-characters in combination. Likewise it reveals the similarity of every individual to a hermaphrodite in that an individual is neither completely male nor completely female but rather a combination of the two with one more dominant than the other. Thus in technical language every individual is a bisexual, i. e., a pseudohermaphrodite if not a hermaphrodite proper.

The following chart may illustrate the ratio of maleness to femaleness and the relation of distribution of hermaphrodites proper to pseudohermaphrodites:



in which the triangle *ABD* equals masculinity and the triangle *BCD* femininity. The overlapping of the two triangles represents at each point, whether moving toward the right or toward the left, the relatively normal ratio of bisexuality in any particular individual. Within the lines *AB* and *CD* are included hypothetically all human beings. To the left, masculine individuals or individualities predominate; and to the right, feminine individuals or individualities predominate.

Thus the numerical distribution of individuals may be indicated by the camel-humped curve $BEGE^1D$. In the region of G are hermaphrodites proper; in the regions of the humps E and E^1 are the bisexual monosexuals male and female respectively. In other words the dip in the curve between the two humps represents the true hermaphroditic bridge between the two so-called monosexuals. This bridge is the true atavistic regression to the primitive hermaphroditic common parent. Within each so-called monosexual group persists the evolutionary struggle between male and female characters. Thus each individual, whether male or female as to the primary nature of the gonads, is secondarily bisexual or pseudohermaphroditic.

Here it is again fitting to insert biological and psychological evidence in support of the above-mentioned considerations. Krafft-Ebing, renowned sex-psychopathologist, writes: "The original bisexuality of the ancestors of the race, shown in the rudimentary organs of the male, could not fail to occasion functional if not organic reversions, when mental or physical manifestations were interfered with by disease or congenital defect." Elsewhere: "The individual being must pass also thru these grades of evolution. The psychophysical sexual difference runs parallel with the high level of the evolving process. The individual being must also itself pass thru these grades of evolution; it is originally bisexual but in the struggle between the male and female elements either one or the other is conquered and a monosexual being is evolved which corresponds with the type of the present stage of evolution, but traces of the conquered sexuality remain." It is interesting to find a great physiologist, A. Biedl, maintaining a similar viewpoint: "The secondary sexual characters develop in a masculine or feminine direction, according as to whether the masculine or feminine internal secretory glands predominate. The occurrence of heterologous secretory sexual characters is explained by the supposition that the internal secretory portion of the sexual glands that belongs to the other sex obtains the upper hand."

The recent discovery of and extended research in the internal or endocrinal glands have given a new impulse to the study of the relation they bear in sex-determination. There are numerous glands in the organism which have a two-fold function: their autonomous biological mission and their subservient co-operative mission to the primary sex-character—the gonads. For example, the mammillary gland which beside its proper functioning of lactation bears also the closely interrelated rôle to the ovaries. The stimulation of the mammillary glands not only stimulates them in growth and secretion but also stimulates ovarian secretion. The pituitary body or gland controls obesity and in females is closely interrelated with the gonads. So with the other endocrinal glands which underlie the several biological structures and functions of the organism the exact rôle of which is being investigated. Hermaphrodites offer the best field for the study of endocrinal activity. In hermaphrodites the activity of the internal glands is exaggerated or else heterosexual in a very conspicuous manner.

Blair Bell ("The Sex Complex") and Bucura ("Die Geschlechtsunterschiede beim Menschen") have gained particular prominence owing to their experimental studies of the functioning of the thymus, thyroid, parathyroid, hypophyseal, mammillary, pineal, suprarenal, pituitary glands in the post-natal sex-determination, especially as to psychic and somatic sex-characters. Blair Bell verifies his histological findings by the study of hermaphrodites. In the bisexual monosexual of today the functioning of a number of the internal glands may be that of the opposite sex, leading to the complexity of the general psychic character of the individual.

As recently as 1918 Miss Mary O'Malley, clinical director of St. Elizabeth's Hospital, Washington, D. C., in an interesting and significant paper indicates the possibility of a symptomatology of such pathological polyglandular syndromes. Thus according to her investigation there are five major symptoms:

1. A deviation of the anatomical configuration of the body, including to a degree faulty skeletal development. Under this symptom is classified the masculine or feminine character of the outline of the body, the pelvis, the larynx, the features, the shape of the hands and the feet. Quite an importance attaches to the conformation of the hand as whether feminine ("type en long," acromegaly) or masculine ("type en large," gigantism).

2. Adiposity or fatness. The presence of fatness—a feminine character—is symptomatic of heterosexual internal secretion in the male while leanness, a masculine trait, is symptomatic of heterosexual internal secretion in the female.

3. A disturbance of the pilous system. Here is classified the masculine or feminine character of the hair as whether strong and coarse or light down, soft and nearly invisible; of the beard, the mustache, the hypertrichosis of the body, especially the stomach and chest. Thus the presence of a light beard or mustache in the female is indicative of underlying masculine endocrinal functioning while the absence of beard

or mustache in the male is indicative of underlying feminine endocrinal activity. The etiology of hirsutism involves, besides the hyperfunctioning of the gonads, the anomalous functioning of other endocrinal glands.

4. Disturbances of the genital function, such as of menstruation, and of the secondary sex-characters which resemble those of the opposite sex. Such disturbance of menstruation may include precocious menstruation, irregularities of menstruation, delay in the establishment of the menses, arrest of menstruation extending over long intervals. Here may be included anomalies of the external genitalia which shall be spoken of shortly and the alteration of the sexual bivalency from prepubertal masculinity or femininity to post-pubertal femininity or masculinity.

5. Disturbance of the psychosexual development—psychic hermaphroditism which is manifested in the peculiar contrary sexual inclination to femininity and to masculinity or to heterosexuality and homosexuality. "The psychical anomalies are displayed in the behavior of the individuals and in the content of their mentally disordered thought and dissociation of ideas which is the expression of their unconscious strivings."

The study of the comparative morphology of the two sexes points to the possibility of additional complexity as regards the maleness and femaleness of certain structures in the bisexual organism. Belfield illustrates this point in regard to the variations in morphology of the larynx. The male relatively differs an octave from the female as to the pitch of the voice in proportion to the greater length of the laryngeal cords. Feminine laryngeal cords differ only slightly from those of children in length. Hence the larger in appearance the so-called Adam's apple the more masculine the voice, provided the vocal cords are equally taut. However, masculine voices are frequently found among masculine women. Again Belfield points to the descendency of the male from a quasi-feminine or hermaphroditic common primitive ancestor of the two sexes as evidenced in the feminine rudimentary organs in man such as the supernumerary teats or as the normal male teats. Relatively the osseous and muscular structure of man varies from that of woman in accordance with the greater struggle for existence which man has had to face. This is also the case with head, skin and hair. Through phyletic use and disuse we have seen the pelvis relatively larger in the female than in the male. These characters are by no means absolutely transmitted through sex-linked inheritance, for in the bisexual we see the heterologous inheritance of these very characters. The male may have soft skin and the female tough skin; the male may have a small head or a soft downy hair or large pelvic region or large buttocks and the female the contrary.

Thus far we have seen the complexity of secondary and tertiary sex-characters in the character-complex. This complexity pushes even over into the sphere of the primary sex-character—the genital organs. Here as elsewhere the true hermaphrodite offers a splendid field for study. From such a study can be brought out in relief what exists in the bisexual monosexual in less clearly defined lines. Ernst Haeckel thus in his "Evolution of Man" points to the analogous relation between the female and male genitalia and suggests the probable hermaphroditic source. Accordingly the female clitoris is analogous to the male penis; the labia minora and majora to walls of the male scrotum; the vulvar cleavage to the suture in the male extending from near the anus over the scrotum up the dorsal side of the penis to the glans; the ovaries to the testes. In the baby boy the testes are up in the body and only fall down into the pockets of the scrotum sometime after birth. In hermaphrodites these characters of the genitalia above-mentioned are inherited in the disordered heterosexual fashion which called forth the name. In bisexual monosexuals these genital characters are also heterologous. Maeder points out two great types of woman, the masculine clitoris-type and the feminine womb-type, owing to the variation in the above-mentioned regards. The masculine or clitoris type is tomboyish, enjoying sports and making more of sex-gratification than the womb-type, who is passive and whose pleasure is in the fruit of the womb.

Blair Bell has pushed his experimental study even over into the ovarian and testicular glands and finds so far that the secretion of these glands varies for different individuals. The greater the secretion of these analogous organs the nearer masculine the individual, whether male or female. Thus he points to women of hyper-secretive ovaries as incapable of even moral restraint.

From the hermaphroditic standpoint the male is an ensemble of masculine and feminine characters, as likewise the female. The dominant masculinity or femininity in the bisexual ensemble determines the dominant psychic tendency of the individual either toward femininity or toward masculinity. This very point was of supreme importance to Adler ("Der psychische Hermaphroditismus im Leben und in der Neurose"). For him the most sickly diathesis, physical or psychical, is that one which lies in the middle ground between pure femininity and pure masculinity. Such a diathesis is an hermaphroditic one, that is, a vestige of the primitive hermaphroditic existence. Such an individual, like any vestigial organ, is subject on the physical side to weakness, corpulence, sickliness, awkward behavior, infantile ailments as enuresis, incontinentia alvi, flatulence, stuttering, short-windedness, vertigo, insufficiences of the visual and auditory apparatus, congenital or early acquired deformities, striking ugliness, etc.; on the psychic side to timidity, psychic instability, dual personality, compulsion-neuroses and other extremely neurotic phenomena. If the individual is congenitally equipped with a predominance of masculinity, a compensatory-process is set up to atone for insufficiencies or inferiorities. This masculine protest or compensatory-process is variously described as "unchecked aggression, activity, power, courage, freedom, compulsion-neuroses, wealth-striving, attack, sadism, authority." On the other hand, if the individual is congenitally equipped with a predominance of femininity, a compensatory-process is set up towards femininity, a feminine protest towards submission, love, passivity, masochism, obedience and compassion. Although the dominant tendency, whether masculine or feminine, asserts itself conspicuously, yet there reside in the character-complex latent remnants of the conquered tendencies which also occasionally assert themselves. This latter phenomenon is noticed pronouncedly in the study of eunuchs. Castration in the male appears to give the ascendency to hitherto latent feminine tendencies. Steinach of Vienna in his "Regeneration" gives some results of his experimental study of vasectomy in the male which indicates that feminine tendencies assert themselves. Likewise ovariotomy or oophorectomy in the female gives the ascendency to hitherto latent masculine tendencies.

The vast field of homosexuality studied by Krafft-Ebing, Hirschfeld, Ellis and Moll more commonly furnishes examples of heterologous feminine and masculine tendencies within the bisexual monosexual. Such extreme psychosexual perversions are, to be sure, wholly within the field of morbid pathology. The same considerations, limited, however, to normal individuals, reveal a struggling of sex-characters for masculine or feminine ascendency. Individuals falling within the domain of normality, however, are those possessed with heterosexual as opposed to homosexual inclinations.

II

The foregoing exposition has proven itself profitable if only the significance of its content for character-formation is gleaned. Character from the standpoint of psychodynamics has particular reference to those instinctive and emotional urges which constitute the very dynamo of a living organism. They not only condition all our responses, i. e., our activity, but, what is more, the very thoughts we shall think.

What then are those instinctive and emotional urges? Reduced to primordials, they are reproduction and hunger—primitively one. The reproductive instinct involves with the evolution of the two sexes the masculine urge and the feminine urge. The masculine urge is the will-to-power, to fight, to subdue, to make the most of self, the will to be a man; and its accompanying emotions are hate, anger, revenge, jealousy and envy. The feminine urge, on the other hand, is love, spiritual love, maternal love, passivity, submission and compassion, the will to be a complete woman. Both urges spring out of the respective rôles in the reproductive act. Federn, in particular, attributes the energy-source, as well of all sadistic behavior as of all masochistic behavior, to a libidinous one. In this matter Federn is not by himself, for Sadger and Eulenberg, special students of sadism and masochism, make the same claim. Sadism is the inclination to inflict pain to the beloved by beating, overcoming, torture and other means and is a masculine urge. On the other hand, masochism is the inclination to suffer pain from the beloved and is a feminine urge. These urges which find their primary importance in the reproductive act also find themselves very frequently sublimated into activities and emotions somewhat removed from the primary function: sadism into conquest of wild beasts, of nature and of other men, aggressivity in general, love of self, self-maximation, revenge, will-to-power; masochism into love of children, of home life, social life and spiritual love and philanthropy, not to say anything of neurotic love-fixations and neurotic anxieties from unsatisfied love-propensities.

The dynamic character of the individual is thus dependent upon the dominance of masculine or feminine constituents within the individual. Thus along the gamut of bisexual diatheses ranging from approximately absolute femininity to approximately absolute masculinity there may be grouped four general character-types, i. e., two subtypes under the male line and two subtypes under the female line. Thus follows a scheme of the four types with lists of comparative psychic characteristics:

MALE LINE		FEMALE LINE	
No. 1 female-MALE	No. 2 FEMALE-male	No. 3 MALE-female	No. 4 male-FEMALE
Sadistic	Masochistic	Sadistic	Masochistic
Aggressive	More passive	Aggressive	More passive
Will-to-power	Will-to-love	Will-to-power	Will-to-love
Hate	Love	Hate	Love
Ambitious to attain a goal	Paterfamilias—goal of ambition	Ambitious to attain a goal	Family—goal of ambition
Considers woman inferior — enemy of woman save as means to sex-gratification	Lauds woman	Considers woman inferior—enemy of woman rôle save as means to sex-gratification	Lauds woman-rôle
Differentiates self from woman	Would like to be a woman	Differentiates self from woman	Would like to be perfect woman-mother
Superior in intellect	Inferior intellect	Superior intellect	Inferior intellect
Rational	Intuitive	Rational	Intuitive
More conscious	More unconscious	More conscious	More unconscious
Removed from youthful type	Nearer youthful type	Removed from youthful type	Nearer youthful type
Revengeful	Forgiving	Revengeful	Forgiving
Jealous	Not jealous	Jealous	Not jealous
Malevolent	Benevolent	Malevolent	Benevolent
Envious	Charitable	Envious	Charitable
Cruel	Compassionate	Cruel	Compassionate
Egoistic	Social	Egoistic	Social
Misanthropic	Philanthropic	Misanthropic	Philanthropic
Ungrateful	Grateful	Ungrateful	Grateful
Discourteous	Courteous	Discourteous	Courteous
Vain	Modest	Vain	Modest
Courageous	Fearful	Courageous	Fearful
Selfish	Generous	Selfish	Generous
Impenitent	Penitent	Impenitent	Penitent

The character-traits enumerated above are peculiar to the more masculine of the male and female lines; and to the more feminine of the male and female lines. Thus underlying the psychological and moral character-traits of any individual are biological characters predisposing the individual to masculine or feminine tendencies.

The four great psychological character-types above indicated correspond exactly to the four great biological character-types of bisexual humanity an account of which latter was given in Chapter I.

No. 1	No. 2	No. 3	No. 4
M_2	M_1	F_2	F_1

For reasons to be seen in the following chapter, it is preferable to call these character-types thus:

No. 1	No. 2	No. 3	No. 4
Adlerian Male	Freudian Male	Adlerian Female	Freudian Female

after Adler and Freud, the two great founders of psychoanalysis whose doctrines of the neuroses open to us such a profound insight into the very psychological nature of these great character-types.

III

Question arises whether or not it would prove remunerative to throw the searchlight of psychoanalysis upon the lives of its very founders. Such an exploration, to be sure, would reveal a wealth of insight as regards the seemingly irreconcilable antagonism which exists between Freud and Adler. More than this, it would contribute a much needed correlation between their respective theories. In evidence of the above, the following considerations may lend some meager suggestions:

Freud himself makes public in his "History of the Psychoanalytic Movement" the irreconcilable antagonism which existed between Adler and himself, which in 1911 culminated in the former's actual withdrawal from the Freudian school and in the founding of a new school of his own. This last resort was reached only after much bitter personal antipathy, an example of which is immediately evidenced in the embarrassing terms with which Adler once in the presence of the Psychoanalytic Society addressed Freud: "Do you believe it is such a great pleasure for me to stand in your shadow all my life?" From the inferior position of Freud's pupil, Adler independently arose to the commanding position of his hated rival.

The fundamental nature of this seemingly irreconcilable "scientific antagonism" lay in the personal psychic nature of the two men, whom we may excellently study in their respective exteriorizations, i. e., in their respective doctrines of the neuroses.

As a result of a long and painstaking clinical experimentation with psychotics and neurotics, Freud formulated his far-famed theory of the etiology and therapy of the psychoneuroses. It must not be hastily assumed that Freud, in formulating his remarkable theory, ignored the labors of his predecessors in this field in whose work he had been schooled. He himself gives due credit to his masters, Breuer, Liebault, Bernheim and Charcot. It was upon the immediate instigation of Breuer, Chrobak and Charcot that Freud sought a deeper insight into the origin of the neuroses. He had early sensed the unusual stress these men laid upon the *vita sexualis* in the etiology of disorders not to be explained by the old physico-chemico-anatomical diagnosis.

This strange sort of etiology was readily seized upon by Freud and investigated, with the result that he has given the world a well-shaped doctrine of the neuroses—one which is essentially based upon the sex-instinct and the inhibition of its function. It is very important for a comprehensive grasp of the Freudian viewpoint that one understand the significance both of sex-instinct and of its inhibition.

1. Sex-instinct from the standpoint of the Freudian psychology is essentially comparable to the more philosophical vital urge labeled by Schopenhauer "the will-to-live" or by Bergson "élan vital." By Freud, however, it is considered more from a psychological aspect as the basal instinct of life, the vital creative dynamic which is working its way upward through organic matter, speaking in Bergsonian language. At once it looms much larger and more inclusive than the sex-instinct of common parlance. It comprehends hunger and sex as primarily identical and would embrace still other instinctive impulses and their accompanying emotions as partial impulses (*Partialtriebe*) which have become specialized and seemingly dissociated from the original sex impulse through psychic evolution. Let us quote Freud in this regard.[2] "We reckon to the sexual life also all activities of tender feelings which have proceeded out of the spring of primitive sexual emotions, even if these emotions have experienced an inhibition of their originally sexual aim or have exchanged this aim for another less sexual. We use the word sexuality in the same inclusive sense as the German language uses the word *lieben*."

It is thus that Freud sees fit to give to his sex-instinct, conceived as one big, imperative, creative, organic sex-wish, the more semi-vitalistic designation of "libido." As von Hartmann conceived Schopenhauer's will-to-live as unconscious, so Freud conceives his libido as unconscious; and in addition it is governed solely by the pleasure-pain principle.

2. The greatest obstacle to the joyful fruition of the libido is the cultural repression, chiefly moral, imposed from

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[2] "Ueber 'wilde' Psychoanalyse." 1911.

without. Thus, for Freud, consciousness, whose supreme task is to adjust the individual to the social milieu, acts as the psychic agent of repression and is called by him the reality-principle (*Realitatsprinzip*). Here one sees an analogous relation between Bergson's creative *élan vital* pushing its way up through resisting matter in the organic realm and Freud's libido pushing up its way through the psychic hindrances imposed by consciousness in the psychic realm. The impediments to the libido summed up in repression do not annihilate it but cause the mental disturbances grouped under the genus psychoneuroses as hysteria, anxiety-neuroses and so forth.

Many psychic mechanisms have been improvised by the unconscious libido in order to overcome in its struggle with the inhibiting effects of consciousness, some few of which may be tabbed off as follows:

1. Sublimation—a process by means of which the repressed libido escapes the endopsychic censor of consciousness in the noble guise of a more refined impulse as spiritual love.
2. Transposition of feeling, or ambivalency of emotions, where one emotion is transformed into its opposite, as especially love into hate.
3. Dreams, day-reveries, slips of the pen and tongue, unconscious word associations, infantilism, hysteria, symbolism, mysticism, religion, hypnotism, myth and the comic, all represent various channels of escape for the libido.

The subconscious libido, according to Freud, has its own thought-life in many respects akin to Bergson's intuition, the affective thought and memory of Ribot, the Herbartian apperception, the autistic thinking of Bleuler. Ideas sensory and conscious in origin have infiltrated to the unconscious realm here somewhat akin to memory and are associated according to their affective value or libido-value (Herbart's interest?) into larger idea systems or Freudian constellations or complexes, a sort of fusion of libido and idea, making for their dynamic quality. The whole cannot be more nicely described than in the very language of Freud: "The wish is the father of the thought" which might be continued in the old phrase "The thought is father to the deed." This unconscious thought process follows the regular pleasure-pain principle, and the associations formed contrast strongly with the more conscious reality-logic. For example, the dream presents strikingly the mode of unconscious reasoning.

Freud opens up a new vista in child psychology when he emphasizes strenuously that "all neuroses have their foundations laid before the fifth year" and that "the infantile is the unconscious." The significance of these statements immediately becomes clear if it is assumed with Freud that the unconscious libido of early childhood is not yet repressed by cultural or moral standards executed by consciousness, but that it has free spontaneous play. Later, when cultural standards impose themselves, the adolescent consciousness represses childhood strivings of the libido, leading to what Freud calls amnesia. The major unconscious complexes of childhood then are the Oedipus—and Electra-Complexes. The babe soon selects the parent of opposite sex as his or her favorite or love-object. The male child loves incestuously his mother, and the female child thus her father. Up until this time sex selection has been limited to the family circle. Even among the healthy-minded it is hard to become unattached from these infantile sexual fixations, and the subject is found later falling in love, he or she knows not how, with an extra-familial love-object which is the replica of the father or mother prototype. A great deal more difficult is the freeing at puberty when the fixated parent has unconsciously and unduly encouraged the attachment. The neurotic child must later find himself or herself incapable of freeing himself or herself from these infantile and incestuous sexual aims. While for the most part the sexual life of the child is latent, nevertheless it manifests itself in what Freud calls polymorphous perversity such as suckling, thumb-sucking, stimulation of erogenous zones, infantile masturbation, exhibitionism, narcissism, playing, springing, running, seeing, hearing, urinating, defecating, anal-eroticism, muscle-eroticism and thigh-friction. Retardation at any one of these forms of libido-manifestation may lead to adult sexual perversion of a purely psychoneurotic type.

Puberty is the period during which the sexual instinct comes to maturity. Along with the fuller pubescent awakening of the libido comes the more stern repression of it by consciousness to adjust the individual to the environment. The adolescent is now confronted with a more difficult struggle. Hypertrophied self-consciousness sets in, likewise an increase in dreaming. Around this period the adolescent may suffer sexual shocks or traumata; and if the nervous constitution has previously been oriented about the father or the mother in undue proportion, thereupon results a manifest flight from reality in hysterical attacks. A psychoanalyst or doctor may cure the patient of his or her disequilibration only to have the *Affekt* transferred from the mother or father to the physician. This transfer (*Uebertragung*) may continue from person to person, even to a sublimated suprapersonal love of

God. It is in the directing of the love impulse to reality that Freud sees the panacea of all psychoneurotic maladies.

Wholly another etiology Alfred Adler assigns to the psychoneuroses. "The picture which one derives from Adler's system is founded entirely upon the impulse of aggression. It has no place at all for love. One might wonder that such a cheerless aspect of life should have received any notice whatever; but we must not forget that humanity oppressed by its sexual needs is prepared to accept anything if only the 'overcoming' of sexuality is held out as bait." The above quotation is from Freud[3] and does reasonable justice to the relative positions of the two men, notwithstanding the wake of sarcasm it carried with it.

Adler, reducing the philosophy of Nietzsche to a psychology, makes of the will-to-power (*Wille-zur-Macht*) the basal instinct of life and primarily identical with the evolutionary nisus. Thus the will-to-live is equivalent to the will-to-power. The exuberance of life manifests itself in great deeds, and supremely so in the lives and accomplishments of great men.

Adler sees the genesis of the will-to-power instinct in sex and more specifically in the masculine sexual energy. Thus all masculine emotions, instincts, traits of character both psychic and physical represent the manifoldness of the will-to-power. In such a manner may be ascribed to the will-to-power all varieties of tendencies as the following: the ego-impulse (*Ichtrieb*), the aggression-impulse (*Aggressionstrieb*), the will-to-survive, the struggle for existence, the conquest of nature, cruelty, murder, sadism, war, selfishness, avarice, suspiciousness, envy, asceticism, self-love, the tendency to disparage others, the will to be leader, jealousy and revenge. This masculine urge encounters in its upward career through organic life various obstacles both organic and environic which it must overcome. The supreme obstacle is of an organic nature; and, as Adler shows at length,[4] organic deficiencies or inferiorities as anomalies, especially such as of the palatal, conjunctival, pharyngeal and patellar reflexes, elicit the assertion of the will-to-power or the masculine protest to superiority. Environic obstacles which evoke the feeling of inferiority (*Minderwertigkeitsgefühl*) are such as rank, morality, social esteem, birth and wealth. Here mechanisms must be resorted to by the will-to-power in order to overcome such as:

1. Compensation, or that mechanism by which the will-to-power asserts itself through another channel than through

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[3] "History of the Psychoanalytic Movement."

[4] "Studie ueber Minderwertigkeit von Organen." Berlin, 1907.

the one blockaded. For example, an ugly person may compensate for this organic defect by psychic superiority (*psychische Mehrleistung*). The compensation is always away from feelings of femininity towards feelings of masculinity; from weakness towards strength; from love towards hate; from passivity toward activity; from inferiority towards superiority; from below towards above; from insecurity towards security.

2. Security-tendency (*Sicherungstendenz*). The neurotic of the Adlerian type sets a goal for his will-to-power, and this goal or guiding-idea becomes a refuge from reality. In the more neurotic individual these goals are but neurotic fiction without much regard for reality and actual attainment. The more accentuated fiction orients about the maximation of self and resembles the delusions of grandeur in paranoia and dementia precox. The neurotic sets out upon his or her "historic mission." The inability to act out this fiction results in the bankruptcy of the "mission." The neurotic collapse frequently culminated in insanity or suicide is but the dirge of a smattered ambition.

At several crises in life, feelings of inferiority are strongly elicited as at menstruation, the epoch of menstrual activity, the epoch of sexual activity, pregnancy, puerperium, climacteric, examinations, danger of death, stage of fitness for marriage. At such crises the masculine energy if possessed in any degree seeks to assert itself.

Adler sees in the right-directing of the aggressive will-to-power (egoistic) impulse to reality a panacea of all psychoneurotic maladies.

IV

Into the theoretical antagonism between these two doctrines of the neuroses enters significantly the personal equation. That is to say, the two great founders are themselves complementary in character-type. This explanation has already been intimated not only by Freud and Adler themselves but also by Rudolph Reitler, Paul Federn, Carl Jung and Alphonse Maeder. The present paper will merely suggest the bisexual nature of the above-mentioned complementariness between Freud and Adler.

To understand the psychoneurotic constitutions of Freud and Adler is to become at once acquainted with the masculine and feminine principles. On this point Freud and Adler themselves are much in accord, if we may rely upon the suggestions which emanate from their respective statements.

Thus Adler writes[5] that every nascent constitution has latent within it both sadistic and masochistic components. Heredity and environment determine which of the two components shall be evoked and shall predominate in the individual's life. Masochism in his estimation is equivalent to the feminine *Sexualtrieb*, i. e., to the Freudian diathesis; sadism to the masculine *Aggressionstrieb*, i. e., to the Adlerian diathesis.

On the other hand, Freud[6] has come to the same general conclusion. Thus he writes: "The picture which one derives from Adler's system is founded entirely upon the impulse of aggression. It has no place at all for love." The same chord is struck when Freud[7] retrenches in admitting that the beginnings of hate, of aggressivity, go back in the psychogenetic scale very far, and hate is as strong if not stronger than love.

Provided we assumed each *Neurosenlehre* as the unconscious exteriorization, projection or expression of its founder's inner psychic life, we are privileged to probe the deeper psychic constitution of the respective men by use of their theories.

Sigmund Freud has given us no factual history of his life save in a few personal references. These latter relate to his Jewish extraction, his pacifistic tendencies in counterdistinction to the Teutonic aggressivity in the late World War, and his extreme sexual-mindedness as evidenced throughout his theory of the neuroses and which strikingly countenances the strong sexuality attributed racially to the Jewish male.

More striking for the present paper, however, are the symbolic self-revelations of his feminine inclinations in his "neurotic fiction," i. e., his theory of the neuroses. For convenience the projections of his mixed soul of predominantly feminine inclinations may be tabbed off as follows:

1. Outstanding is his primary emphasis upon woman, *das ewig-Weibliche*. His experimentation is for the most part confined to woman, with whose soul he has an innate sympathetic rapport. This inner *Einfühlung* into woman-soul is peculiar to his own constitution, i. e., he himself in psychic life is predominantly woman or womb-man, to use the Anglo-Saxon word. On the other hand, his theory which has such great significance for our knowledge of the feminine psychic life gives but secondary importance to the masculine soul. For him masculinity exists only as a repressing agent or as a subsidiary completion of woman. The Freudian man is a

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[5] Adler's "Zur Kritik der Freudschen Sexualtheorie der Nervosität," *Heilen und Bilden*, 1911, and "Der Aggressionstrieb im Leben und in der Neurose," *ibid.*

[6] "Zur Geschichte der psychoanalytischen Bewegung." 1914.

[7] "Zeitgemässes ueber Krieg und Tod," *Imago*, 1915.

parasite upon woman, to whom he owes his very existence. This matter of male parasitism is couched nicely in the following by Belfield: "For in many animal types there is no male; when he does appear he is at first merely a parasite upon or within the body of the female." On such a level the male lives only for the female and has not evolved to such a stage that he lives for himself.

Here Freud agrees with the conclusion of Bucura over sex-differences that the female sexual impulse is primary; the masculine secondary. The female's supreme biological mission orients about reproduction, which mission is fulfilled through sexuality. In the words of the Middle Ages, "Woman is the priestess of sexuality."

In this entire matter Freud belongs to the type of men Fourier describes: "qui sont femmes par la tête et par la coeur." He is allied with the feminine soul. He is an instance to bear out the statement of Th. Gautier: "It often happens that the sex of the soul does not at all correspond with that of the body, and this is a contradiction which cannot fail to produce great disorder."[8]

2. There naturally grows out of the preceding his strong emphasis upon love, a paramount feminine sentiment. Here Freud is at one with Madame de Staël when she wrote that "Love, which is an episode in the life of man, is the entire history of woman"; likewise with Byron, who has phrased it thus, "Love in man's life is a thing apart; in woman's life her whole existence."

Again, Freud closely associates hunger with love, two very interrelated elements in the feminine nature—nutrition and reproduction.

According to Adler, who follows the great sex-psychopathologists, Moll, Krafft-Ebing, Hirschfeld and Ellis, love is masochistic and feminine, while hate and aggression are sadistic and masculine. These psychological traits are sustained by the findings of Blair Bell and Bucura that masculinity is characterized by domination and certainty while femininity is characterized by passivity and hesitancy. Otto Weininger attributes to masculinity the "liberating" impulse and to femininity the "uniting" impulse. Even Freud describes the masculine impulse, for him centripetally oriented about the erection of the male genital, as a dark impulse to mighty action, to penetrate, to dash to pieces, elsewhere to tear open a hole. But even this is the beginning of the aggressivity of which Adler writes and which Freud condemns as leaving no place for love.

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[8] Theophile Gautier's "Mademoiselle de Maupin."

Only in so far as a man is feminine, i. e., possesses a feminine emotional life, is he able to love. For Freud the great regenerative force is love, which is excellently illustrated in his study of Jensenn's "Gradiva."

3. Countless anxieties and fears peculiarly group themselves about the feminine psyche: anxieties about the realization of the love life, and about the many partial impulses of love as tender feeling, maternal love, sociality, the *Musiktrieb*, the *Tanztrieb*, the home instinct, the love of the beautiful, the *sentiment d'incompletude*, religious love, timidity, morality, her organic and functional nature, the children and her male companion of whom she would like to be the mother.

In the words of Ovid, "Love is a thing full of anxious fears." Thus the neurotic fiction of Freud unmasks to us these many fears and anxieties of his male-female soul.

4. The prominence given the womb in the Freudian theory at once reveals the strong feminine strain within his soul. Characteristic of Freud is it to emphasize the womb as whence one comes and whither one is ever striving to return. It is the security goal of man. The primary biological function is that of the womb, the matrix of humanity. Thus in the hindrances to its function along the path of life lie all of human, alike male and female, neurotic struggles, according to Freud. Even in this matter of the eternal longing for the mother and for return to the womb Freud portrays the original parasitism of man upon or within woman. The longing for the mother in itself is a confession of femininely inclined masculinity in somewhat the sense as the popular language speaks of a mama's boy as one who is dependent on the mother and who has not enough masculinity to assert his individuality, his independence.

The womb is synonymous with femininity. Helmont of old phrased it: "Propter uterum solum mulier est quod est." The ancient Greeks saw in hysteria an affection produced by the unsatisfied womb, the inability to be a complete, genuine woman. Maeder in an article entitled "Ueber Zwei Frauentypen" points out the clitoris- and womb-types of women. The clitoris-type is already manifesting a strong *Einschlag* of masculinity, therefore is of the Adlerian diathesis. The clitoris-type can aid repression by the easy transformation or sublimation of the female sex-impulse into masculine aggressivity. This *Backfisch* would like most to be a boy; she dreams later very often thereof. She loves sport, hunting; she is passionate, violent, aggressive and enterprising. The womb-type woman, on the other hand, represents the approximation to the absolute woman or Freudian type. With her the maternal instinct is strong. For us the womb-phantasy of Freud represents his symbolic effort to identify with woman the unearthing of his dual sex-nature with stress upon femininity.

5. In the matter of infantilism we also have a splendid apocalypse of his mixed soul. Symbolically the child represents undifferentiated sexuality in which both masculine and feminine, both active and passive, impulses alternately function. This a-sex-ensemble is attributed to the infantile by the folk-soul in the neuter gender of words, as *Das Kind, to nepion*. This is also strongly emphasized in Freud's idea of infantile polymorphous perversity in which thumbsucking, suckling, stimulation of erogenous zones, muscle-, skin-, anal-, mouth-, mucous membrane-eroticisms play a great rôle. Polymorphous perversity is symbolic of Freud's characterological mélange of femininity and masculinity. Rosenstein, speaking of bisexuality, writes in aphoristic form: "Der Mensch ist seiner Anlage nach polymorph pervers."

It is before the fifth year that the individual *Sexualrichtung* takes place. The dominant sexual character of femininity or of masculinity manifests itself. Whether masculine or feminine, this dominant sexuality is always accompanied by the recessive sexuality. Thus love and hate exist together in each individual.

Adler sees a compensation-correlation of inferiority to superiority between the infantile and the adult, between the feminine and the masculine, weakness and strength, which correlation is equivalent to equating the infantile to the feminine to weakness. The infantile is nearer to the feminine and therefore nearer to the womb and the phyletic. In this light is seen somewhat of the significance of the adage: "The child is father to the man." Symbolically the infantile represents Freud's weakness, his femininity, his bisexual nature.

From yet another standpoint the love of children is peculiar to femininity. There is no such thing as paternal love, says Dr. Kinkle. What we call paternal love is only the maternal love in man, owing to his bisexual nature.

6. Freud's major complexes, the Oedipus—and Electra-Complexes, are exteriorizations of the duality of love and hate constellations, or the duality of masculine and feminine principles within him. He can hate only in order to love; he can be man only in order to be a part of woman. These complexes formed before the fifth year are upon further sex-differentiation indicative of the co-existence of both masculine and feminine principles within the individual, whether predominantly masculine or predominantly feminine.

7. Repression, which plays so important a rôle in the Freudian doctrine, is highly symbolic of the femininity in his make-up. Rudolph Reitler sees in Adlerian masculinity the emphasis upon the repressing (*Das Verdrängende*); in the Freudian femininity the emphasis upon the repressing (*Das Verdrängt*). Over against the masculine expressivity is the feminine impressivity. Freud in giving prominence to repression reveals the feminine component of his psychic constitution. He feels as a woman, i. e., he feels repressed. In other words he feels the repression by the masculine within him, the repressing tendency of the Ego. In his exteriorization of repression he portrays his own mixed soul.

8. The emphasis upon the phyletic which is extradited in his theory of the neuroses is indicative of the femininity within him. Woman is nearer to the phyletic, the racial; she is the great eugenic force. Her supreme biological mission is of primary importance for the preservation of the race, an end for which masculinity and all other aims are of secondary consideration.

9. The unconscious again is representative of femininity in Freud's bisexual diathesis. His stress upon the subconscious points to his feminine *Einfühlung*. The supreme biological mission of woman is the deeper unconscious will-to-live of the race. Bucura indicates as a sex-difference that woman is more unconscious than man, that is, she is more instinctive or intuitive while man is more conscious and rational. Man is more the guardian or protector of woman, of the unconscious feminine. The deeper unconsciousness of the feminine soul is evidenced in the greater liability to clairvoyance, clairaudience, hysterical phenomena and hypnotism.

Some writers, especially Dr. G. Stanley Hall, see a difference between the Freudian and Adlerian theories amounting to a correlation between the Freudian feminine phyletic unconsciousness and the Adlerian masculine ontogenetic consciousness. Of course there is some of both elements in every individual with a predominance of the one or the other. With Freud it is, to be sure, a predominance of feminine unconsciousness.

10. Tender emotionality is predominantly emphasized by Freud. He has a horror of aggression, except in so far as subservient to tender emotion—a characteristic of femininity according to Bucura and Heymann.

If the psychology of the emotions and instincts be according to the masculine and feminine principles dichotomized into negative and positive, active and passive, or masculine and feminine, the affectivity and impulsivity would require a classification of him more on the feminine side.

According to James's tough and tender-minded types, Freud belongs more to the tender-minded type.

11. The artistic impulse, the love of the beautiful, is strikingly portrayed in Freud's literary style and in the literary artistic lives and works which he analyzes. This literary-artistic impulse is peculiar to men of strong feminine admixture, as consistently observed by characterological psychologists. The question is raised that so few women have produced literary and artistic products. A tentative answer might be advanced that women incarnate beauty and love but do not possess enough of masculine energy to express it on paper or canvas, as writing as well as painting belongs somewhat to the active life. Whatever efforts have been made by women in the literary-artistic world have been made by the more masculine women. On the other hand, the feminine man possesses the proper mixture of love of beauty and activity to execute it upon paper or canvas. Too masculine men find art too delicate an activity. Nietzsche points out this difference among his supermen and calls the less masculine the Apollonian and the more active the Dionysian. The latter type is the preference of Nietzsche as superman. An interesting distinction is made by Carl Jung in his "Psychologie der unbewussten Prozesse," where he divides men into the intravert or thinking type and the extravert or feeling type. He classifies Freud in the extravert type and Adler in the intravert type. In his "Psychology of the Unconscious," Jung holds that the literary-artistic product is the fancy child of the mind—cherished with all the maternal love that an actual mother can bestow upon her own child—a phantastical vicariate of the actual product of maternity.

12. Finally needs be cited his classic phrase, "Perversion is the negative of neurosis," which conveys information of his own psychophysical disposition, namely, that he must not be classed with those so perverted in their sexual inclinations as to be called homosexual. Although his bisexual nature bears a feminine stress, he is still heterosexual in his inclinations.

The value accruing to the above self-revelations of Freud's own inner life rests mainly upon its bisexual nature. His life presents the struggle of masculine and feminine psychic forces with a predominance of femininity. He would assert the masculine protest, but the feminine which is stronger within him would incline him to the feminine protest. He would be a woman and true to his deeper nature because of the predominance of the woman-soul within him. Freud is a man who presents the entire emotional life of a feminine diathesis; he has a complete *Einfühlung* or inner co-experience with feminine existence, an unquenchable impulse to be a woman, to conceive, to give birth, to experience the joys of maternity as in the case of the primitive *couvade-pratice* which he analyzes. In short, he knows how it feels to be a woman. This indelible feminine "*disponierende Anlage*" of his constitution breaks forth in his theory of the neuroses. For such a feminine diathesis, all repression, all feeling of incompleteness, are monistically condensed into the obstruction of the love-impulse, of the feminine eugenic force. However, from the functional side he cannot be an actual woman, although from the feeling side he can. This at once brings to the fore again the sexual duality of his soul. He plays a double rôle of man and woman. He acts like a man and feels like a woman; he is both subject and object. In his inability to become woman functionally, he is left free to sympathize with her and to doctor her ills. For him, love is a regenerative force—a resurrection of the phyletic, i. e., of woman's supreme biological mission—a spiritual recreation of man in woman.

Freud, true to the feminine soul, is of the tender-minded type which indulges in the delicate significance of love-dreams, artistic productions, symbolic language, the sexually comic and phantastical, the eternal feminine, the eternal infantile. For him the infantile (the feminine) is the unconscious.

The greater the repression of the feminine love-impulse, the greater the intensity of the love-energy and the sublimation or refinement of the impulse and the more delicate the erotic symbolism and autistic thought processes. Sadger draws attention to the fact that increase of sadistic impulse on the one hand increases correspondingly the masochistic impulse on the other. The same phenomena may take place all within the one individual of bipolar sexuality. Repression is sadistic, and with its increase comes the intensification of the love impulse and the erotic psychoses. For Freud the complex of the repressing and the repressed is strong, i. e., within him is the sado-masochistic complex with stress upon the masochism.

By way of parallel to Freud in many respects is the life of Jesus Christ, a Jew, who when his people were oppressed by the more virile Romans, in a sublimated spiritual sense, proclaimed himself the savior of man, and who in the Freudian sense revolted against his father and rescued his mother. In a highly sublimated sense he exteriorized a Kingdom Come from the prototype of his mother's womb to which he unconsciously longed to return. This incestuous longing or love sublimated to charity is the keynote of the Christian doctrine of salvation which to the masculine Nietzsche appears the religion of humility, of compassion, of inferiority, of femininity. The Christian faith, an incorporation of feminine intuitions, is that of sublime love with a morality of turn-the-other-cheek and that of which the chief virtues are faith, hope and charity, all of which judged in the light of the bisexual principle are essentially feminine and masochistic character-traits. A striking observation of the religious psychologists is that the Christian religion has more followers by far among the female sex.

The conversation between Christ and Nicodemus brings out in bold relief the impossibility of entering the Kingdom Come without being born again, without entering the mother's womb again in spirit rather than in flesh. Interesting again by way of parallel is the tender quasi-maternal love of Christ for children. His own much quoted words in this matter are in Matthew 18:3-6:

"Verily I say unto you, Except ye be converted, and become as little children, ye shall not enter into the kingdom of heaven.

"Whosoever therefore shall humble himself as this little child, the same is greatest in the kingdom of heaven.

"And whoso shall receive one such little child in my name, receiveth me.

"But whoso shall offend one of these little ones which believe in me, it were better for him that a millstone were hanged about his neck, and that he were drowned in the depth of the sea."

The same feminine strivings of Jesus Christ are they which predispose Freud.

It would hardly be amiss here to make some mention of Carl J. Jung, leader of the Swiss school of psychoanalysis. He has very much in common with Freud, differing only in his greater feminine tendency. In his neurotic fiction or his psychoanalytic theory he places even greater emphasis upon the unconscious, reverting to the deepest strata of the soul, the primal roots of food and fertility, called by him the collective or superpersonal unconscious—the very soul of the race or of woman. Thus it is he who has elaborated the mother-complex or the womb-complex. All neurotic struggle thus reduces itself to the longing to return to the womb—the security goal of man. In his analysis of the Freudian and Adlerian character-types into extravert or feeling-type and introvert or thinking-type, one without much perplexity can readily see that Jung himself belongs to the feeling type—the Freudian type which inclines toward the feminine, the intuitive, and which recognizes the primordiality of affectivity.

Alfred Adler, likewise, has given us no traditional biography. Only here and there are gleaned important references to his personal life. Undoubtedly the incident which reveals to us a most significant insight into his psychoneurotic constitution is his personal antagonism to Freud. It will not be assumed that Adler was entirely masculine. He also possessed a bisexual diathesis but one in which masculinity was the dominant character. Adler as a student of Freud revolted against him and gave birth to his own theory of the neuroses in which aggression, masculinity and the will-to-power conspicuously feature. Diametrically opposed to the femininity of the Freudian doctrine is the masculine emphasis in the Adlerian theory.

Adler, endowed by heredity with pronounced strains of Teutonic virility, could not by nature bear subordination to the feminism of Freud. His neurotic fiction, i. e., his doctrine of the neurotic disposition, is an exteriorization of his own inner life. Adler is by no means as kryptic and symbolic in the projection of his inner psychoneurotic life. In his doctrine he portrays with no concealment his masculine tendency. The sexual duality of his nature is portrayed by him in his continual emphasis upon such dualisms as masculine-feminine, adult-infantile, strong-weak, active-passive, hate-love, aggressivity-passivity, superior-inferior, above-below, sadistic-masochistic, healthy-sick. In Adler himself there exists the prototype of this bipolarity of masculinity and femininity or of this sado-masochistic complex. Between the two poles there is working a compensation process—a will-to-power—the assertion of the masculine protest. In other words, from a bisexual standpoint we may speak of Adler as a Man-Woman. The man in him is in the predominance through heredity. This masculinity expresses itself in a will to differentiate itself from the woman in him, the will to assert masculine autonomy, to be above, to be a genuine man (*Vollmann*), the neurotic struggle of the *Ichtrieb*.

Adler recognizes that the masculine and feminine principles originally were of a hermaphroditic source (in micro-organic realm) and that the two principles which now correspond roughly to male and female of the species are fundamentally evolving along different lines. This primitive hermaphroditism is recapitulated in each individual, i. e., each individual is a psychosexual hermaphrodite or psychosexual pseudohermaphrodite. He sees in the masculine principle aggressiveness, will-to-power, *Ichtrieb*, sadism, hate, all of which he himself incarnates.

Organic inferiority as well as general feeling of inferiority, both of which are given a great deal of prominence in his theory, represent the horror of being a woman, of being less than a genuine man. It is a revolt from the parasitism within or upon the female to autonomous development. For man to be deficient in his organic mechanism is to be like woman and forces him back to a primitive level of being a subsidiary completion of woman or to be dependent upon her, hence a dread of organic inferiority. The predominance of masculinity over femininity in the bisexual character-complex issues in the masculine protest, the compensatory will-to-power. Adler holds that the organ inferiority pushes back its source to the sexual apparatus and thus to heredity. In this manner he attributes inferiority to a return to the likeness of woman. The masculinity within him will atone for such foetal or prenatal insufficiencies. Psychically or functionally he will compensate for somatic defects with being superior. He will be "above," will be the man behind the throne, he will make history as a security goal.

A parallel to Adler is in the neurotic life of the Anti-Christ, Nietzsche, who glorified the superman, extreme individualism, the eternal masculine, the will-to-power and the sadistic morality of might makes right.

The literary style of Adler is rugged and masculine as compared with that of Freud. He is blunt, and his lines burst forth with anger and hate, according to Freud's estimation. The analysis of literary-artistic subjects is rare indeed with Adler.

Adler, true to the masculine principle, is of the tough-minded type which indulges in selfish reveries of power, hate, revenge, self-maximation, sadism, reality-thinking and activity. The unconscious does not occupy so important a place in the masculine diathesis as with woman, whose orientation is almost entirely inward and downward to the organic. On the other hand, the masculine impulse is always oriented upward and outward toward conflict, with external stimuli involving the higher mentation. Man is the superstructure of woman.

Extremely significant are the contrasted types of women with which Freud and Adler respectively deal. Only women of a strong masculine diathesis are those who fall under the analysis of Adler. They are women who would be men and who are, to be sure, masculinely constituted physically as well as psychically. Such women number among themselves those called militant, those called courtesans and vampires, those who, Joan-like, hold masculine positions, who refuse marriage and the rôle of motherhood, those who strongly believe themselves the equal of men and even vie with him in physical as well as mental endeavors and finally those whom Magnus Hirschfeld in his "Die Transvestiten" and Havelock Ellis in his article "Sexo-aesthetic Inversion" describe as ambitious to become man-like in the matter of wearing-apparel as well as of bobbed hair. Wherever masculine tendencies are struggling for expression in either sex, there we see a fitting application of the Adlerian analysis.

Psychoanalysis has reiterated the sayings of the Scriptures that, as a man thinketh, so is he; or judge not that you be not judged, in that the thought of a man is an unconscious exteriorization or self-projection. Why then should it not be perfectly legitimate to judge Adler by his theory as a bisexual with masculine strivings in the ascendency?

BIBLIOGRAPHY

Adler, A. "Organic Inferiority," Trans. New York, 1917.
"The Neurotic Constitution," Trans. New York, 1917.
Adler and Furtmüller. *Heilen und Bilden*, München, 1914. Especially the following articles by Adler:
"Der Aggressionstrieb im Leben und in der Neurose."
"Der psychische Hermaphroditismus im Leben und in der Neurose."
"Die psychologische Bedeutung der Psycho-analyse."
"Ueber neurotische Disposition."
"Zur Kritik der Freudschen Sexualtheorie der Nervosität."
Asnaurow, Felix. "Sadismus, Masochismus im Kultur und Erziehung." München, 1913.
Belfield, W. T. "Man and Woman: The Female the Higher Type." Chicago, 1907.
Bell, W. Blair. "The Sex Complex." London, 1916.
Bjerre, Poul. "The History and Practice of Psychoanalysis." Trans. Boston, 1916.
Blanchard, Phyllis. "Impressions of the Psychological Sessions of the International Conference of Women Physicians," *Ped. Sem.*, Vol. XXVI, No. 4, Dec., 1919.
Blüher, Hans. "Zur Theorie der Inversion," *Int. Zeit. f. Aertzt. Psa.*, 1914.
Bleuler, E. "Das Autistische Denken," *Jahrbuch f. Psa. u. Psychopath. Forschungen*, 1912.
Bucura, Constantin. "Die Geschlechtsunterschiede beim Menschen." 1913.
Carpenter, Edward. "The Intermediate Sex." London, 1907.
Caullery, M. "Les Problèmes de la Sexualité." Paris, 1917.
Conklin, E. G. "Heredity and Environment." Princeton, 1915.
Ellis, Havelock. "Man and Woman." London, 1914.
"Sexo-Aesthetic Inversion," *Alienist and Neurologist*, 1913.
Eulenberg. "Sadismus und Masochismus."
Federn, Paul. "Beiträge zur Analyse des Sadismus und Masochismus. I. Die Quellen des männlichen Sadismus," *Int. Zeitschr. f. Aertzt. Psa.*, 1913.

"Beiträge zur Analyse des Sadismus und Masochismus. II. Die libinösen Quellen des Masochism," *ibid.*, 1914.
Faguet, Emile. "Le Feminisme." Paris, 1910.
Finot, Jean. "Problems of the Sexes." London, 1913.
Fliess, Wilhelm. "Männlich und Weiblich," *Zeitschr. f. Sexualwiss*, 1914.
Fouillee, A. "Temperament et Caractère." Paris, 1895.
Freud. "History of Psychoanalytic Movement." Trans. by Brill. New York, 1917.
"Three Contributions to Sexual Theory." Trans. by Brill. New York.
"Beiträge zur Psychologie des Liebeslebens," *Jahrb.*, 1912.
"Formulierungen über die Zwei Prinzipien des psychischen Geschenens," *Jahrb.*, 1912.
Introduction to Psychoanalysis." New York, 1921.
Et altera opera.
Haeckel, Ernst. "Evolution of Man." New York.
Hartung. "Homosexualität und Frauemanzipation."
Heape, Walter. "Sex Antagonism." New York, 1913.
Heymann. "Die Psychologie der Frauen." Heidelberg, 1910.
Hirschfeld. "Die Transvestiten."
Other works.
Jekels, Dr. Ludwig. "Einige Bemerkungen zur Trieblehre," *Int. Zeit. f. Aertz. Psa.*, Vol. I.
Jung, Karl. "Die Psychologie der unbewussten Prozesse." Zurich, 1917.
"The Psychology of the Unconscious." New York.
Maeder, A. "Guerison et Evolution dans la vie de l'âme." Zurich, 1918.
Marion, H. "Psychologie de la Femme." Paris, 1907.
Michelet, J. "L'Amour." Paris, 1858.
Möbius. "Beiträge zur Lehre von den Geschlechtsunterschieden." Halle, 1903-1906.
Moll. "Konträre Sexual-Empfindung."
Niedermann. "Der 'Männliche Protest' im Lichte von Kinderanalysen," *Z. f. Psa.*, 1914.
O'Malley, Mary. "Certain Pluriglandular Anomalous Functions Associated with Psychopathic Sexual Interests," *Journal of Nerv. and Ment. Diseases*, July, 1918.
Putnam, James J. "The Work of Alfred Adler, Considered with Especial Reference to that of Freud," *Psa. Review*, 1916.
"The Theories of Freud, Jung, and Adler," *The Journal Abn. Psychology*, Aug., 1912.
Rank, Dr. Otto. "Der 'Familienroman' in der Psychologie des Attentäters," *Int. Zeit. f. Aertz. Psa.*, 1913, Vol. I.
Reik, Theodor. "Die Bedeutung der Psychoanalyse für die Frauenkunde," *Archiv. f. Frauenkunde und Eugenetik*, II *Band*, 2 *Heft.*, Dec. 29, 1915.
Reitler, Rudolph. "Kritische Bemerkungen zu Dr. Adler's Lehre," *Zentralb. f. Psa.*, 1911.
Rosenstein. "Die Theorien der Organminderwertigkeit und der Bisexualität in ihren Beziehungen zur Neurosenlehre," *Jahrbuch*, 1910.
Roux. "Psychologie de l'Instinct Sexuel." Paris, 1899.
Sadger, J. "Ueber den Sado-masochistischen Komplex," *Jahrbuch*, 1913.
Stekel. "Das Liebe Ich." Berlin, 1915.
Thomson and Geddes. "Sex." London, 1914.
Tridon. "Psychoanalysis." New York, 1920.
Weininger, Otto. "Sex and Character." Putnam, New York, 1906.
Weismann. "La Durée de la Vie."

EDUCATION IN FRANCE SINCE THE WAR

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Written for the *Pedagogical Seminary* and translated by Helen M. Downey

I—The University

At first the war threatened to close our schools and interrupt the work of instruction, and unfortunately it too often impaired the latter by taking from it teachers, students and premises; but instruction was stopped or abated only in the invaded regions, and everywhere the war awakened admirable zeal for retaining academic work in school, for exalting patriotism among the students, as well as for organizing their co-operation in wartime activities. That zeal worked miracles,[1] and the school was largely spared the moral depression which followed the war. Better yet, it is unquestionable that by reason of its own initiative and of painful necessity, enthusiasm and desire for progress have asserted themselves in the university. In order to give here a brief but faithful testimony of it, and yet stick to facts, we shall consider in order the different kinds and grades of public instruction.

Higher Education—Higher education is still insufficiently endowed. Its installation and material resources are still below normal status and what is its due. Like education in general, it has not the place it should have in public esteem, but there is undeniably progress as well as effort to extend and revive it (1) within the organization and (2) in its work of expansion.

I. Material and financial means are lacking for the advancement and dissemination of science, and buildings, laboratories and collections are too meager. Not only are our finances inadequate, however, but the cost of retaining what already exists has doubled or trebled. Nevertheless, without mentioning increase of salaries, in each of the latest budgets sums have been added for improvements of property and supplies, while laboratories are being more and more generously endowed. We wish, especially, however, to make flexible, to enlarge and to animate the organization itself, its programs and methods. The courses in law and medicine have been reorganized and lengthened. The reform for the degree of licentiate in letters (*licence ès lettres*) has introduced the régime of the degree of licentiate in sciences (*licence scientifique*). Four *certificates* for studies, chosen optionally, except for the degree of licentiate of instruction (*licence d'enseignement*), from those offered by each faculty give the title of licentiate (*licencié*) without obliging the student to take all under the same faculty, a system favorable to elective studies, to the convenience of foreign students and to attendance by the same student at several universities. Life is broadened and liberty extended also by the creation of faculty or university *Institutes*, drawing together, in collaboration productive for research and instruction, diverse groups hitherto closely juxtaposited or even actually separated. Another innovation is the expansion or rather creation of features advantageous to the students (dormitories, centers, and dining halls not run for profit, playgrounds, athletic fields, etc.), and the idea of admitting student representatives at least to certain meetings of the university councils, and with certain reservations, is gaining ground. Above all it would be impossible to overestimate the importance of the decision to admit to university councils "lay" members, individuals prominent in the city or region; this "liaison" is of great interest and has already manifested good results.

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[1] W. Thamin, "L'Université et la Guerre." Hachette.

A vigorous impetus is bringing progress to higher technical instruction (agricultural, industrial, commercial) in special institutions as well as in universities (Grenoble, Nancy, Lyons, Toulouse, Lille, Bordeaux, etc.) where institutes of applied science are increasing in number, and these institutes are inviting distinguished patricians as professors, more and more, thus forging new links between each university and the environment in which it labors. Better yet, if possible, certain universities are ready to organize—as English universities have done at the request of trades unions—a popular higher education introducing science and scientific work to a select group of manual workers. In some places this may soon be a reality.[2]

Hereafter the faculties of science and letters will collaborate directly in the training of primary teachers. It will be possible, if not obligatory, to substitute for the first part of the requirements for the special certificate for teaching in normal schools (*Certificat d'aptitude au Professorat des Ecoles Normales*) three university certificates; a licentiate degree (*licence*) will also be equivalent to the second part. Finally, many wish that closer relations might be established among the universities by granting to students liberty of passing more easily from one to the other, and by exchange of professors.

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[2] *Semaine pédagogique de Lyon*, "1920 Conférence de M. le recteur Toulin."

II. Every day there is developing more and more intensely, and more flexibly, the movement for extension of our higher education in foreign fields. Favored or demanded by parliament, the Ministry has organized the National Bureau of Universities (*Office National des Universités*), the Pedagogical Museum (*Musée Pédagogique*). Not only is there an increase in the number of exchange professors with America, very recently with Belgium, Italy and Spain, not only are we receiving more and more foreign students and sending to foreign countries men and women scholars, but we are consolidating those relations by permanent estalishments. At Paris especially chairs have been created by foreign governments (United States, England, Czecho-Slovakia) and in these countries and others (Roumania, Serbia) for our professors. Last October a Chinese university was established at Lyons. Reciprocally France has established instruction, or an entire system, in some of these countries, as our Institute of London, of Florence, of Madrid, of Syria (schools of law, medicine, technical school of Beirut). There is under consideration a plan for combined organization of scientific and university relations between Japan and France, and with apologies for unintentional omissions I insist that this entire service is growing and assuming definite shape both in the Ministry of Public Instruction and that of Foreign Affairs as well as in each university.

Secondary Instruction—Secondary instruction is on the eve of a reform which will perhaps be an accomplished fact when these lines appear. As we are trying to reform it at one stroke, without partial experiments, it would be impossible to introduce in it the various innovations which I have indicated in higher education. During the war it, too, lived by an admirable effort. Since the war the *lycées* for boys have regained part of their personnel, the teachers who survived, and they have resumed their regular life, diligent in spite of everything, and in spite of the complaints that are heard. This group, like all others, has engaged in a heated campaign to obtain necessary increase of salaries and without doubt a happy innovation, born of circumstance, may be expected—a spirit of solidarity which, forcing the hand of the old individualism, has drawn together in associations and federations not only the entire personnel, men and women, of the secondary schools, but also all the members of the university corps and of the three branches of instruction. This spirit, one may hope, will survive fortuitous demands and, moving forward, will give its attention to pedagogical questions.

This is the principle of the generous enterprise of the *Compagnons*, young officers who discussed educational matters in the army, even in the trenches, and in some articles which appeared later in two volumes under the title "The New University" (*L'Université Nouvelle*) shook public opinion and proposed an entire plan of improvement.

At first a radical, indeed revolutionary, system was offered, uniting free education in a vast university corporation, defending Latin, and the school unique, demanding especially connections between the different stages of the university system, and then between that and society. This bold program was afterwards modified: the corporation and Latin were abandoned, but the principle of the school unique (without formal organization) and that of connections were retained.

The question of reforms was studied also in remarkable investigations by the Society of Civil Engineers and by *La Plus Grande Famille*, both advocates of a principle of disinterested and preferably Latin culture. This has been submitted to public opinion by the Minister and has been put before properly constituted organizations. The Superior Council is going to deliberate on it; the battle between partisans of unique secondary education with Latin, and these of the two parallel groups, classical and modern, will doubtless be heated. But aside from this conflict, which, unfortunately, often becomes a political quarrel and finally clouds the rest, what progress might rightly be expected from the reform; reduction of class hours already begun in a small way to twenty a week; physical education; abolition of required courses; relief, always promised, always postponed; programs; increase of individual work on the part of the students; suppression of colleges which are vegetating; more general admission of primary pupils of worth, and exclusion at entrance or even in preparatory courses, of mediocre or even gifted students adapted to a different contribution to society. A great step forward would be to disengage our secondary education from whatever makes it dull or perverts it; that is what the eminent worth of our teachers demands.

Finally, more and more pressing is the problem of secondary education for girls, which certain people would like to make absolutely identical with that for boys and which must in any case procure for an increasingly large proportion of its clientèle access to lucrative careers.

Primary Instruction—While awaiting the change which will undoubtedly come to it after the others, the elementary school has preserved its prescribed limits and methods; the extension of the course to fourteen years is still under discussion. Let us point out only the progress of instruction in practical arts and physical education, to which a little more time is given in some places.

The teachers have entered with especial ardor the campaign for increase of salaries; but here too one must note as progress the spirit of solidarity which has drawn them to the two other groups.

The most important innovations are the thoroughgoing reforms in the higher grades. This is especially the task for directors of primary education. There has been a desire to make flexible its scope and programs, to animate its methods and to raise its level even to that of scientific work.

The extra years' courses, which used to add only one year to elementary studies, are becoming substitutes for the upper primary school, allowing, according to their clientèle, extra courses of even four years, and adapting themselves to needs, whether general preparation for normal school or professional education, especially agricultural, and finally combining with industrial courses.

The rôle of higher primary schools is "to form human beings who, under the direction of leaders from the universities and higher schools, may constitute the framework of the economic and administrative army; foremen, overseers, clerks." They are preparing students for city careers and normal schools. The duration of their studies, instead of being limited to three years, can be prolonged to four or five. Hitherto rivalry, at the risk of useless repetition, existed between these and the technical schools, which are under the control of another Ministry; and the duality, if not conflict, seemed incapable of solution. It has just been settled, thanks to the creation in the Ministry of Public Instruction itself of an under-secretaryship of technical instruction. In each of the two kinds of schools either general or professional education, one of which will be subordinate to the other, will predominate, the two personnels will no longer be controlled by two Ministries, the program of the upper primary schools is lightened; above all, instruction will no longer be concentric, but progressive; each year the student will see something new, will have the knowledge and pleasure of advancing.

The same idea dominates the more radical reform of normal schools. They are retained instead of being replaced by pedagogical institutes of the university or reduced to one year of professional training following classes in the *lycée*. They remain primary; but the régime of 1909, which superposed on two years of preparation for the higher diploma (*brevet supérieure*) a year of both personal and professional training, has been given up.

The student may enter at fifteen years, not after nineteen; but as, after 1923, every teacher in a public school will be obliged to have passed at least one year in a normal school, *auditors* will be admitted up to the age of twenty-five. For three years they will pursue in parallel courses, or rather in closely related ones, general and pedagogical training, inseparable for a future teacher. The higher diploma (*brevet supérieure*), achieved by stages, becomes the simple, natural end of these annual studies. Dominated by an entirely new spirit, these studies will have to deepen rather than to extend knowledge, to train intelligence down to basic principles, to form it by handling documents and realities, so that the teacher may indeed be above his calling. He will go to sources, will have a foretaste of methods of higher education, will have an opportunity to preserve, even in his profession, freshness of point of view and the curiosity of research. On leaving normal school he will be on the level of a good student in the philosophy class or a first-year student in the university.

The moral program insists on professional obligations and the duty of the incumbent to remain loyal. Psychology will have as its principal object as scientific a study as possible of the child; here is added a daring innovation, experimental psychology with exercises in observation and laboratory work. Another novelty, and one which headmasters, teachers and students like, is the introduction of sociology applied, of course, to ethics and education, but destined, it seems, to furnish connecting links and the directing idea for all branches of instruction. There is, however, superposed a study of general principles of science and ethics; this will form in future school teachers philosophical and critical spirit, not removed from truth and moral realities, to which, says the program, every system gives only interpretation, not the lie. Likewise, the teaching of history must inspire love for the genius of France and will be faithful to the national spirit, of which teachers must be representatives in each commune and each school. Finally, professional preparation will cover at least fifty half-days a year; and all practical exercises—thereby are understood practice lessons—will be held in a primary school.

The breadth of ideas and noble ambitions which are translated into this reform are apparent. To some it seems too ambitious to be practical, and there is fear that recruiting of pupils and even of teachers, will not be adequate. The future will tell, and the experiment is worth trying.

This reform necessarily involved one in training normal school teachers and upper primary teachers. Their special diploma or certificate of aptitude (*certificat d'aptitude*) has also been much modified, in accordance with these very programs, and made to approach more nearly to university studies; for the second, as well as for the first degree, may be substituted certificates from a faculty (*certificats de Faculté*). The examination of Primary Inspection, also modified, will allow a written test on ethics or sociology.

Reformed by the instructions of 1908, kept functioning by a personnel of general and departmental women inspectors the "mother's school" (*école maternelle*) has made great progress, especially in the past year. Less and less has it become a school, more and more maternal. Physical care, games, manual exercises which are also games, singing and rhythmic movement there occupy the children in an atmosphere of joy under gentle discipline of good habits. Setting aside all systematic dogmatism, but better and better informed, the best teachers use freely whatever in each new system, Montessori or any other, is suitable for the French temperament. Certain classes, though crowded, are admirable, and the example they give is contagious.

Technical Education—Since the war technical education has been the object of special attention and solicitude. Reorganization is planned not only by specialists but by eminent statesmen, by the Chambers of Commerce, Agriculture, Industry. It has been eagerly undertaken by the Under-Secretary of State recently established in the Ministry of Public Instruction. The Chamber of Trades, demanded by the last Industrial Congress held at Lyons, will have an important rôle in it. The great problem is that of the part that should properly be left to general culture. In spite of this, definite plans will doubtless soon result in a well-organized system in which technical instruction of all grades, primary, intermediate, and higher, will harmonize with the others.

CONTINUATION SCHOOLS IN NORWAY

WITH A SHORT OUTLINE OF THE NEW NORWEGIAN NATIONAL BILL FOR COMPULSORY CONTINUED EDUCATION

BY MARTIN L. REYMERT, PH. D.

According to available statistics for the summer 1919 (end of public-school year 1918-1919) the situation for the children leaving the public grade school may be summed up thus for sixty-three Norwegian cities and towns:

Children leaving from all cities and towns: 10,322. Number of above getting no further schooling: 5,961, which means that more than one-half of all children in Norwegian cities and towns had no plan for further schooling after graduation from the seventh grade (average age, 14-15) of the public school. It must be added, however, that some children do go back to some continued schooling after they have been working for some time.[1] These are of course not included in the above figures. If numbers were available for the country districts, they would most likely not show any better aspects.

CONTINUATION SCHOOLS IN NORWAY, 1921

Up to the time of the new bill, now before Congress, we had in our state school laws some short general suggestive regulations concerning continuation schools. These may be summed up thus: Continuation schools may be established as classes or courses of from 4 to 10 hours a week. The schools shall be administered by the local school-boards, but the State Department of Education must approve the schedules. The continuation schools are meant to be for young people 14-18 years of age. The instruction shall be given free of charge. The above is about all there was said up to the present proposed bill for compulsory continued schooling. In the meantime, however, quite a number of continuation schools were established both in city and country districts, and recently a great interest has manifested itself all over the country—for more continuation schools.

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[1] For "Adult Education in Norway" the reader is referred to Prof. Dr. Otto Anderssen's treatment of this subject: Bulletin III of The World Association for Adult Education, February, 1920 (13 John Street, Adelphi, London, WC. 2.)

Examples of Now Existing Continuation Schools

Kristiania Continuation School for Girls—Started, 1900, with 20 pupils a year. 1919: 41 regular classes and 24 practical evening courses, plus 6 day classes. All in all, 100 women teachers, all of them with regular and special training, many of them having studied continuation schools in foreign countries.

The day classes have 30 hours a week for 10 months per year, the evening classes up to 10 hours a week for 8 months per year, all throughout 1, 2 or 3 years.

The course of study is in the main the same for the day classes and for the two yearly evening classes:

1. Manual training: Dressmaking and sewing of baby outfits; millinery; domestic service.
2. The mother-tongue, including sociology.
3. One foreign language (English).
4. Book-keeping and mathematics.

To the above is added, in the day classes, hygiene with gymnastics and outings, plus one weekly hour of Bible reading.

Singing is not a separate subject, but shall be taken care of during the school hours. Also for the evening classes one tries to get gymnastics in for those who can possibly give time to it. Special social evenings are arranged.

Practical history, geography and natural science are included in the mother-tongue lessons and are given in connection with topics of the day, daily events, etc., a main principle of the continuation school being the keeping in close touch with practical life of today. Therefore practical sociology also has a broad place, including topics as "The Family," "Parents and Children," "Matrimony" (and laws concerning this), "Social Institutions," "Employer and Employees" (laws). "Vocational outlook" is given with special reference to the particular trade schools the girls can enter upon leaving the continuation school. The school has its own library. Literature and arts, especially of modern time, are given consideration (mainly within the mother-tongue), and everything that might have an inspiring influence upon the girls is looked for.

Practical outlooks (especially for the pupils of the day school who have time) are given by visits to orphans' homes, children's hospitals, "first-aid" places, the market-places (open squares in the city where the farmers sell their products directly to the consumers), butcher shops, groceries, bakeries, cooking schools, dressmaking factories, etc. Goods, prices, methods of work, etc., are thus brought home to the girls. Practical museums are also visited. Here the girls may make sketches, for later use in their own sewing, embroidery, etc. The school has also a special trade course for women tailors, frequently visited by all the girls. Outings are undertaken both summer and winter. Sea-bathing trips and skiing trips are most popular.

All the above is possible in the day classes.

The evening classes, with 3 evenings a week from 7 to 9 P. M. (1 or 2 or 3 yearly course) cannot afford the time. The third year of the evening classes is a business course only.

The domestic courses (dressmaking and millinery) are major subjects in the 1-year evening course, but minors in the 2-year course. From the 1-year course most of the girls go into housemaid service in the homes.

The 2-year course has by far the greatest number of pupils, as from this they can go over into business and trade. Upon leaving this course the girls are about 17 years of age. Many of the graduates of the 2-year evening course will come back to school for the 3rd-year business course, after some time spent in work, and a great many of these will include domestic-science courses as minors in their schedule. Statistics gathered by the school show that some of the girls often have a 12-hour day. (Job and schooling in the evening.) As has been touched upon, the school has two trade courses (of its own), one for women tailors and one business course (third year). These are (as the entire school) under the supervision of the city school board by special appointed committees consisting of members having the particular trade training or knowledge. The schedules are approved by the State Department of Education; the cost is covered by city and state, so that the schooling is entirely free for the pupils.

Prerequisite for the course for women tailors is graduation from the 1-year course in the continuation school, or a similar training. The instruction in this course comprises dressmaking (daily and society dresses). The obligatory instruction in drawing is given in the State Trade and Art School, Kristiania. The school has a great many customers, and some of the pupils are given a small fellowship. Upon graduation the pupil is supposed to fill her place as an apprentice in a sewing establishment, and later on in her job she may take the by law prescribed and controlled "Svenneprove," that is, she must make *personally*, without any help, a society dress or a suit to be approved by a special official committee of tailors. (Similar official tests or examinations are by law prescribed for the admittance into all trades in Norway.)

Still later, then, the pupil can (according to the Norwegian trade laws, paragraph 3) obtain "haandverksbrev," official testimony of the right to carry on the particular trade as a master, with her own place of business, etc.

The business course (third year of the general evening continuation school for girls) has the following compulsory subjects: Book-keeping, general office work, business correspondence, typewriting. Electives: Stenography and English (as foreign language). The evening courses last 8 months (September–April). In April the test for book-keeping is given. The successful pupil in this is entitled to obtain "handelsbrev" (according to Norwegian law on business, paragraph 2.) This "handelsbrev" (official business testimony, compare the trade course) entitles its holder to start a business anywhere within the state of Norway—under his own name, and upon personal responsibility. In 1919 the business course had 10 classes, and 177 girls took the prescribed test.

The continuation school for girls has its own specially prepared textbooks for mother-tongue, foreign language, book-keeping and mathematics. The instruction is given in the city public school buildings.

Kristiania Continuation School for Boys—A general city school for boys, similar in the main features to the above described for girls, was started in 1899. In 1916 an eighth grade (elective) was added in the public schools of the city, with 30 hours (forenoon) a week. The above classes are administered by the continuation schools of the city.

General Continuation Schools in Other Norwegian Cities—From 1895 on, most Norwegian cities were provided with free general continuation schools, with program, etc., in the main patterned after the schools in Kristiania, either in the form of an added eighth grade or as evening schools (or both). In general the teachers for these schools are taken among the regular force of the city public school, both in Kristiania and in other cities. Each continuation school for boys and girls in Kristiania has an especially appointed head-master.

Special Continuation Schools

Technical Evening Schools—These schools date back to 1802, "Sunday Schools" in Bergen, Norway, and the now prevailing system received its state regulation in 1918. They are primarily created to meet the demands of the state laws regulating the executing of trade and industry in Norway and are therefore concerned about the training and schooling of the laborers in these fields. To be accepted the applicant must be 14 years of age and pass tests in Norwegian and arithmetic, thus proving that he has at least reached the goal of a full public-school training.

The courses of these evening schools last for 3 years, with an opportunity for a fourth year if desired. The instruction is given for 8 months per year, with 10 hours a week, making 300 hours a year. Subjects are: Norwegian with sociology, keeping of accounts, mathematics and trigonometry, construction and projection drawing, free-hand drawing, natural science, technical drawing.

According to the Congressional Budget for 1921, there are now 60 of these technical evening schools (3 in Kristiania) and 3 state schools for drawing, with a total of 5842 pupils. Of the 64 cities and towns in Norway, 48 (with a sum population of 756,000 inhabitants) have such schools, while they are lacking in 16 cities (with a sum population of 17,700).

The course of study in weekly hours for the successive 3 years may be taken from the table below:

Weekly hours	1st year	2nd year	3rd year
Norwegian	2	2	1
Accounting	..	..	1
Mathematics and trigonometry	3	2	..
Construction and projection drawing	2	..	..
Free-hand drawing	3	..	..
Trade technical drawing and instruction	..	6	5
Natural science	..	..	3
Sum	10	10	10

The Department of Education divides the schools into three groups:

Group I. Mechanics, blacksmith, tinsmith, wagon makers and carpenters. These get 4 hours trade-technical drawing and 2 hours mechanics the second and third years.

Group II. All other trades, with 6 hours trade-technical drawing each year.

Group III. Electricians, with 3 hours technical drawing and 3 hours electrotechnique the second year and 2 hours technical drawing and 4 hours electrotechnique the third year.

Criticism:

1. Time of instruction, 6-8 P. M.
2. Lack of specially trained teachers.
3. Lack of special text-books.
4. Many pupils start some years after graduation from the public-schools, and thus they need a repetition of general courses.

Schools for Home Industries for Girls and Women in Norway—From the middle of the eighteenth and onwards in the nineteenth century one may take it from local literature that home industry had a high standing all over Norway.

As Norway got to be more and more of an industrial country, however, the home industry gradually went on the decline.

Men and women of public note then went on record for a renaissance of the home industry, and in 1861 an "Association for the Promotion of Home Industry" was inaugurated. In 1865 this association started training courses in straw plaiting (basketry) in fourteen different localities. In 1875 a central school for home industries ("Den Kvindelige Industriskole i Kristiania") was established in the capital. In 1900 this was taken over by the state, and since then this school has been the leading one in the country. It has now about 10,000 graduates. The school has a great variety of branches of study and work: Weaving, dyeing, tailoring, linen sewing, repair, ironing, classes for the training of teachers in manual work and arts for girls (art weaving, dressmaking, pattern drawing, etc.). Four to five hundred pupils now graduate every year. The annual fee is 65 crowns. Short courses of all kinds are also offered for a still lesser price. The pupils are awarded stipends and fellowships. There are now quite a number of such schools around in the country, patterned more or less after the one in Kristiania. In all public schools for children and youth in Norway, manual training for girls now has a great place. As a rule, weaving, linen sewing, knitting and some finer handicraft are included in this. Gymnasiums only have no such training, but it is found in all normal schools.

However (outside Kristiania), continuation trade schools in this branch which might bridge over from the general lower public schools of the country to the particular higher trade schools (mentioned above) have been lacking. This gap will now be filled by the new bill for compulsory continuation schools:

Household Schools—Special household and cooking schools date back to 1890, when the first one was established in Kristiania. In 1914 there were 34 such special schools in the country districts and 19 in the cities.

Since 1908 the state covers three-fourths of the expenses, the local community one-fourth.

In all country districts there are now "move-able" household-schools with courses lasting from 3 to 10 months. In a great many cities evening classes for cooking are established for adults with two courses (of 5 months each) per year. In order to get trained teachers for all such schools in the country the state established in 1908 a state training school for household teachers, near Kristiania. Graduation from a normal school or similar training is the entrance requirement. This school has four divisions:

(1) Division A—For the training of household teachers. 1-year course. (2) B—For the training of teachers for the "school kitchens" in the grade schools. ½-year course. (3) C—For advanced training of teachers who have already been practising teaching. 6-weeks course. (4) D—Household school for young girls. ½-year course.

Room and board for divisions A and C is 35 crowns a month; for D, 25 crowns. The pupils of section B live outside of the school. Stipends are granted. Special schools for the training of housemaids are established in Kristiania and Tronhjem.

The first school kitchen in the grade school was established in 1890 in the City of Sandefjord, from private means.

In 1907, school kitchens and household instruction for girls were made obligatory in the grade schools of Kristiania (2 hours weekly in the sixth grade and 3 hours in the seventh). Almost all Norwegian cities now have obligatory school-kitchen instruction in the grades. The state pays the salary of an inspector for all the school kitchens of Norway.

This year (1921) the State has granted 10,000 crowns as an aid for the establishment of school kitchens in very small school communities.

PREPARATORY PART-TIME CONTINUATION SCHOOLS FOR TRADE AND INDUSTRY

Besides some older general trade schools in Kristiania, Porsgrund, Bergen, with courses lasting several years, we have, since 1910, preparatory part-time trade schools in the principal cities of Norway. As an illustration of this type of school we may take Kristiania:

The expenses of these schools are paid one half by the state; the other half (plus buildings) is covered by the city.

The course of study is approved by the State Department of Education. The pupils must satisfactorily have graduated from the grade school (seventh grade). The schools are day schools. The time of the course is 6 to 10 months. The workshop training is given in the school itself. There are now in Kristiania sixteen such preparatory trade schools (with two additional more advanced schools for shoemakers and barbers).

The applicants must be from 14 to 16 and 17 years of age.

All these schools are gathered under one roof—in a separate building. The graduates from the 6 to 10 months' courses are given 1 year credit in abbreviated apprenticeship time. (This apprenticeship time is regulated for all trades by law.)

In Kristiania there are now such schools for the following trades:

(1) Metalworkers, (2) jewelers, (3) carpenters, (4) blacksmiths, (5) finer carpentry, (6) painters, (7) copper and tinsmiths, (8) masons, (9) bookbinders, (10) modeling carpentry, (11) moulders, (12) bookprinting, (13) calciminers, (14) paperhangers and interior decorators, (15) tailors, (16) barbers.

On this general background, then, the new national bill (now pending action in the Congress) for compulsory continued schooling in Norway comes in.

It might be taken from the above summary view that the opportunities for continued schooling have been plenty. The reasons for the public demand, however, that the state shall undertake to organize compulsory continued education by national law are, on the whole, the same as those that brought Wisconsin and other states in America to take similar measures. They may be briefly summed up thus:

1. Most existing continuation schools were evening schools, thus intruding upon the youngsters' well-needed free time.
2. Employers did not always grant the necessary free time from the job.
3. By centralizing the continuation schools under the state, uniformity in program, teacher training, text-books, etc., can be obtained.
4. By making the schools compulsory the state manifests its interest in the difficult adolescence period of the youth of the country.
5. The compulsory continuation schools will tend to raise the quality of work in "skilled labor" and the trades.

In March, 1915, "Norges Lererindeforbund" (the national association of Norwegian women teachers) took the first initiative towards the new bill and passed a resolution urging the State Department of Education to prepare and pass a new paragraph in the public-school law for the cities of Norway, establishing compulsory continuation schools for the cities.

The Congress Committee on Educational and Ecclesiatical Affairs acted favorably upon this resolution, but decided that the question of compulsory continuation schools should be taken up not only for the cities, but for the entire country.

The following year (1916) the "Storting" (Congress) voted to urge the government to prepare such a law.

The matter met with some opposition, however, and not until January 31, 1919, did the Department of Education name a preparatory committee. This committee consisted of known women and men teachers from the lower and higher schools of Norway, together with representatives of business and trade.

Right now the said committee has delivered its official motion to the Department of Education.

The proposition starts with a survey of the conditions now existing for the 14-15 year old child, now leaving the public school and entering a vocation.

The main features of the proposition follow:

1. Every city or city-like community in the country districts shall provide for a satisfactory number of compulsory continuation schools.
2. Proposals for the country districts shall be given by a committee named by the State Department of Agriculture.
3. These schools shall further the general education and character building of the pupils, prepare them for the vocation they choose and make them good citizens. The schools shall be compulsory, and the instruction shall be given free (of payment of fees).
4. The schools shall be arranged as practical schools. They may have a specific practical course as the main feature, or offer a general practical further schooling. Vocational classes shall be established everywhere, where conditions make it possible. By vocational classes is understood a special course that gives a complete training for tailors, mechanics, electricians of various kinds, etc. Work-shops shall be procured in connection with such schools.
5. For such vocational continuation schools a course: "arbeidskundskap" (all knowledge of everything pertaining to the particular trade or vocation; compare Kerschensteiner's "Arbeitskunde"). This particular course shall be given fully one-half of the entire school time.
6. The schools shall not only be vocational, but also have a cultural aspect. Thus social economy and a course in the mother-tongue shall be included.
7. As the pupils also have their jobs to attend to, during the schooling, the school time must not be long. Proposed: 8 hours weekly for 30 weeks a year, or 240 hours annually, throughout the 3 compulsory years of schooling.
8. If a child has 48 hours in all of work, in its job, 40 hours shall be given to the job and 8 hours to the school. No instruction is to be given after 7 P. M.

9. For children not yet having entered upon a vocation or trade, schools with general training courses shall be established. The curriculum here shall include social economies, a course in the mother-tongue, natural sciences and manual training.

10. The continuation schools shall by and by get to be independent schools, with separate buildings, equipment and teachers.

11. It is proposed that the state shall pay the salary of the teachers, and that the local communities furnish buildings, equipment, etc.

12. Administration. The local school board shall administer the schools, but for every vocational class there shall besides be named a vocational committee consisting of three members. One of these shall be named by the school board; of the two others, one by the local employers and one by the labor union of the particular vocation. This committee has the responsibility for everything pertaining to the particular vocational training, draws up plans, etc. Their proposals, however, must be passed upon by the school board.

13. The State Department of Education shall have the upper authority.

14. All teaching positions shall be filled by the State Department of Education through competition and by proposal of the local school board (the same as for the higher schools of Norway).

15. Beside the compulsory 240 hours annually in 3 years, opportunities for further free schooling shall be offered in general school subjects, practical courses and foreign languages.

16. For hours of instruction the number of pupils in a class shall not exceed 30; for instruction and work in the work-shop, not 15.

17. This law is proposed carried through within the first 5 years after it has been passed upon by Congress and government.

Finally, free day schools with 30 hours weekly instruction for 1 or 2 years may be established as an eighth and a ninth grade of the public school. The annual expenditures for teachers' salaries are estimated at 2⅓ million crowns.

The above motion is as yet not passed upon by Congress and government; however, everything looks hopeful. The economical considerations will be the hardest ones to overcome. If the motion will not go through in full, it is safe to say that much of it will very likely be preserved by the final action upon the bill. When the final action will be taken is uncertain, but it is expected in the near future. Besides the above outlined bill for continuation schools, the same committee has also proposed a series of specific trade-business and other vocational schools.

THE REVISED AND EXTENDED BINET-SIMON TESTS, APPLIED TO THE JAPANESE CHILDREN

By Y. Kubo, Ph. D.
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In 1918 I tried to measure the intelligence of the elementary-school children of Tokyo, following the Binet-Simon tests as much as I could. But the modification of the tests to adjust to our children was unavoidable, for our conditions are very different from those of Paris. Next year I published the revised tests, which were much welcomed by our countrymen as they were very applicable. But there were still many imperfect points in them, and I was obliged to revise them again.

The new tests consist of four at 2 and 3 years of age, six at each age level from 4 to 14, and twelve alternative tests, while the old ones contain five at each age level from 4 to 13 without alternative tests. Another important revision of the new tests is adoption of many performance tests to lessen language difficulty, the Otis tests and the army tests to measure the higher mental abilities in older children.

The methods of the new tests are summarized as follows:

Two Years (4 Tests, Credit 3 Months Each)

1. Names the members of the family. (At least three members in baby language, such as papa, mama, grandpa, grandma, the names of brother, sister, maid servant or others.)
2. Points to parts of body. (Two of four.) Nose; eyes; mouth; ears.
3. Names familiar objects in pictures. (Four of eight.) Dog; cat; horse; cow; dove; electric car; train; automobile.
4. Executes one commission, as "Bring the ball."

Three Years (4 Tests, Credit 3 Months Each)

1. Piles five blocks by imitating the same action of experimenter.
2. Compares the size of two dogs in picture.
3. Repeats two figures.
4. Names familiar objects. (Five of six.) Paper; pencil; chop-sticks; ball; scissors; penny.

FOUR YEARS (6 TESTS, CREDIT 2 MONTHS EACH)

1. Gives sex.

2. Names familiar objects in pictures. (Five of eight.) The objects are the same as those of the two-years tests, No. 3. However, in this test the name of the objects must be pronounced in adult language.

3. Repeats six syllables. (Two of three.)

4. Compares the length of two lines.

5. The Goddard's form board. (No error; 1 minute.)

6. Draw round the form. (Porteus' four-years test.)

Al. Colors. (Two of four.) Red; yellow; blue; green.

FIVE YEARS (6 TESTS, CREDIT 2 MONTHS EACH)

1. Counts four pennies or blocks.

2. Copies square.

3. Aesthetic comparison. (No error.) Three paired pictures are modified to the Japanese faces.

4. Comparison of weights. (No error.)

5. Repeats eight syllables. (Two of three.)

6. Finds the way through open paths. (Porteus' six-years test.)

Al. Age.

SIX YEARS (6 TESTS, CREDIT 2 MONTHS EACH)

1. Description of pictures. (Three of four.) Four pictures are entirely changed.

2. Definitions by use. (No error.) Table; chair; stove; horse; mother.

3. Makes rectangle with two parts.

4. Copies diamond.

5. Executes three commissions.

6. Indicates omission in pictures. (Five of ten.) The most of the pictures are taken from "The Drawing Completion Tests" of Pintner and Troops.

Al. Finds the way through open paths. (Porteus' 8-years test.)

SEVEN YEARS (6 TESTS, CREDIT 2 MONTHS EACH)

1. Counts three single *sen* and three double *sen*. (No error.)

2. Right hand and left ear. (No error.)

3. Indicates omission in pictures. (Eight of ten.) The materials are the same as the six-years tests, No. 6.

4. Names four colors. (No error.)

5. Divides the geometrical figures. (Four of ten; 5 minutes.) The figures are adopted from 1 to 10 of Trabue's.

6. Arranges in order four or five series of pictures. (Three of each of six sets; 3 minutes.)

Al. Distinguishes morning and afternoon.

EIGHT YEARS (6 TESTS, CREDIT 2 MONTHS EACH)

1. Counts from 20 to 0. (20 seconds; one error allowed.)

2. Makes change. "If I were to buy two pencils at 4 *sen* each and should give the storekeeper a 50 *sen* note, how much money would I get back?"

3. Arranges in order four or five series of pictures. (Five of each of six sets, 3 minutes). The pictures are the same as those of the seven-years tests.

4. Names date. (Allow error of one or two days.) Day of month; month; year.

5. Comprehension of the following questions. (No error.) "What's the thing for you to do": (a) "If you are going some place and miss your train?" (b) "If a playmate hits you without meaning to do it?" (c) "When you have broken something which belongs to someone else?"

6. Criticizes absurd pictures. (Easy. Four of six; 1 minute.) Three of the pictures are taken from the Trabue's and the other three are added by the author.

Al. Recognizes the value of thirteen pieces of money. (No error.)

NINE YEARS (6 TESTS, CREDIT 2 MONTHS EACH)

1. Names seasons. (No error; order correct.)

2. Places five weights in order.

3. Gives differences. (One difference in each comparison.) Fly and butterfly; wood and glass; paper and cardboard.

4. Divides the geometrical figures. (Seven of ten.) The figures are the same as those of the nine-years tests, No. 5.

5. Finds opposite words. (Six of twelve; 2 minutes.) (1) early; (2) left; (3) bright; (4) white; (5) up; (6) long; (7) high; (8) sky; (9) hate; (10) rise; (11) day; (12) weak.

6. Comprehension of the following questions. (Three of four.) (a) "What's the thing for you to do when you are on your way to school and notice that you are in danger of being tardy?" (b) "What ought you to do before undertaking something very important?" (c) "What ought you to say when someone asks your opinion about a person you don't know very well?" (d) "Whether should we judge a person by his actions or by his words? Why so?"

Al. Definitions superior to use. (No error.) Table; chair; stove; horse; mother.

Ten Years (6 Tests, Credit 2 Months Each)

1. Disarranged sentences. (No error; 5 minutes.)
Sample: the sun the west rises from true false
(1) twelve months one year make true false
(2) floats on water iron true false
(3) of wood all are made cups true false
(4) noise a cannons make loud true false
(5) pens and are used ink for writing true false
2. Interpretation of pictures. (No error.)
3. Repeats four digits backwards. (Two of three.)
4. Reasoning. (Two of four.)

(a) It is Sunday; and on a Sunday afternoon *Hanako* usually plays with her friends, or takes care of the baby, or reads books alone. Today she has no friends, and does not read books. What do you think she is doing?

(b) How do you think the sky is from the following facts?

(1) When an aviator flys high up in the air, he puts on his coat.

(2) There is ice on the top of Mount Fuji even in the summer.

(c) There are ten pine trees in a row on the sidewalk. If you should plant two cherry trees between each of them, how many cherry trees do you need?

(d) Three boys are sitting in a row. *Taro* is to the left of *Jiro*. *Saburo* is to the left of *Taro*. Which boy is in the middle?

5. Places three words in one or two sentences. (2 minutes.) Boys; river; flower.

6. Ball and field. (Inferior plan; the Stanford revision.)

Al. Criticizes absurd statements. (No error; the Stanford revision.) (a) The road downhill. (b) What the engineer said.

Eleven Years (6 Tests, Credit 2 Months Each)

1. Reading and report. (Eight memories.) Last night about half past nine a fire broke out at *Asakusa*. It took about one hour to put it out, but seventeen houses were burnt down. In saving a girl who was asleep in bed, a fireman was burnt on his limbs.

2. Reasonings. (Three of four.) The tests are the same as the ten-years tests, No. 4.

3. Copies two designs from memory. (One, correct; one, half correct. Expose 10 seconds.)

4. Gives similarities between two things. (No error.) Wood and coal; apple and peach; iron and silver.

5. Divides the geometrical figures. (No error.) The figures are the same as the seven-years tests, No. 5.

6. Analogy. (Four of eight; 2 minutes.) Sample: Ship—captain; school—principal. (1) East—west; south—? (2) Emperor—loyalty; parent—? (3) Elder brother—younger brother; elder sister—? (4) Summer—hot; winter—? (5) Pen—ink; brush—? (6) Village—village headman; city—? (7) Land—train; sea—? (8) Japan—Tokyo; England—?

Al. Ball and field. (Superior plan.)

TWELVE YEARS (6 TESTS, CREDIT 2 MONTHS EACH)

1. Defines three abstract words. (Two of three.) Charity; public benefit; probity.

2. Similarities. (Five of 8.) As materials, four series of figures, from the Form A of the Otis tests, and four series of concrete things, from Meyers' "Mental Measure," are adopted.

3. Fills in the omitted words. (One error or omission allowed; 5 minutes.) If you eat unripe——, or play late at ——, or eat continuously——, you have to be unable to go to—— and—— to a doctor.

4. Interpretation of fables. (Three of four.) (a) "The Fox and the Cow." (b) "Hercules and the Wagoner." (c) "The Farmer and the Stork." (d) "The Miller, His Son and the Donkey." These stories are taken from the Stanford revision tests.

5. Criticizes absurd pictures. (Difficult. Four of six.) One of them is taken from the Trabue's, and one from the Meyers'. The other four pictures are added by the author.

6. Gives more than sixty words in 3 minutes with closed eyes.

Al. Criticizes absurd statements. (No error.) (a) The bicycle rider. (Binet.) (b) The girl who was thought to have killed herself. (Binet.) (c) The railroad accident. (Binet.)

THIRTEEN YEARS (6 TESTS, CREDIT 2 MONTHS EACH)

1. Repeats twenty-six syllables. (Fifteen syllables correct.)

2. Finds opposites. (Five of 10; 2 minutes.)
   Sample. Present—to-morrow immediate *past* yesterday late

(1) decay—fall continue flourish destroy produce
(2) lengthen—break shorten vanish decrease extend
(3) help—man work give hinder dislike
(4) love—like angry fear hate friend

(5) obey—officer approve order resist regulate
(6) boast—pessimism modesty anxiety patience timidity
(7) refinement—grace roughness violence eminence nobleness
(8) extravagant—miser economical poverty rich saving
(9) cause—reason effect achievement outset aim
(10) demand—exchange sale profit supply receipt.

3. Repeats six digits. (Two of three.)

4. Places three words in one or two sentences. (2 minutes.) Yokohama; fortune; sea.

5. Clock. (Two of three; the Stanford revision.)

6. Analogies. (Five of ten; 3 minutes.)

Sample. day—bright night—?—shine star *dark* sleep fearful

(1) book—author painting—?—marble model magazine painter man

(2) temple—Buddha ?—God—gate school shrine house charm

(3) electric light—candle automobile—?—wagon electricity speed tire light

(4) Order—confusion ?—war—guns peace powder stone army

(5) ice—water water—?—river cold steam thirst sea

(6) moon—earth earth—?—Mars sun clouds stars world

(7) food—body ?—engine—firemen coal smoke train conductor

(8) sorrow—misfortune joy—?—grief happiness hatred failure pride

(9) village assembly—village ?—city—mayor member city assembly citizen

(10) president—republic emperor—?—kingdom empress territory king empire

Al. Gives similarities in three things. (Two similar points in each series of the things.) Wool, cotton, leather; rose, potato, cherry trees; knife-blade, penny, piece of wire.

Fourteen Years (6 Tests, Credit 2 Months Each)

1. Reasoning. (No error.)

(a) How do you measure exactly 4 *go* of rice with a 3-*go* measure and a 5-*go* measure?

(b) What is inducted from the following facts? (1) When a cannon ball falls into the sea, it does not float. (2) Gold is about twenty times heavier than water. (3) When a copper coin falls into the water, it sinks. (4) Brass is twice heavier than water.

(c) I started from my house and walked 100 *ken;* I turned to the right and walked 50 *ken;* I turned to the right again and walked 100 *ken.* How far am I from my house?

2. Similarities. (Five of ten; 3 minutes.) Find the way in which the first three things on a line are alike. Then look at the five other things on the same line and draw lines under two things that are most like the first three.

Sample. hat shawl glove—hand *collar* head *shoe* house
(1) blue yellow green—sky red sea black flower
(2) plum pear apple—camellia seed peach juice orange
(3) bowl dish tea-cup—chop-sticks cup desk bottle dress
(4) small red good—heavy size color go strong
(5) horse dove firefly—cow wagon leg goat toy
(6) run fly walk—blue sleep long far rise
(7) ship horse train—sail tiger automobile move aeroplane
(8) Japanese socks flag sail—dress ship rod handkerchief table
(9) kindness falsehood abuse—say honesty take theft bad
(10) kindness honesty sympathy—charity selfishness idleness fidelity dishonesty

3. Disarranged sentences. (Six of ten; 3 minutes.)
(1) short an elephant has a nose true false
(2) apples people are many of fond true false
(3) flour of rice bread is of made true false
(4) bananas grow ground the in true false
(5) lead very and things light gold true false
(6) water float and cork on wood true false
(7) is dangerous in the streets dark walk to true false
(8) among good children swimmers are there true false
(9) winter when the comes trees fall leaves all of true false
(10) higher rarer the ascend the we the grow air true false

4. Divides the geometrical figures. (Four of five.) The first figure is added by the author, and the other five figures are taken from Trabue's.

5. Analogies. (Seven of ten; 3 minutes.) These tests are the same as the 13-years tests, No. 6.

6. Criticizes absurd pictures. (No error.) The pictures are the same as the 12-years tests, No. 5.

Al. Finds opposites. (Seven of ten; 2 minutes.) These tests are the same as the 13-years tests, No. 2.

Above tests are arranged from the results having tested about 1200 children in Tokyo, ranging in ages from 2 to 15 years. These tests are selected out of those tests which could be done 70% to 90% by children of that age, almost all by children of one year above that age, and 20% to 40% by children of one year under that age.

The distributions of the I. Q. of children ranging in ages from 6 to 9 years, recently tested by author, are as follows:

I.Q.	Numbers			
	6 yrs.	7 yrs.	8 yrs.	9 yrs.
125-121	1		1	
120-116	1	2	1	2
115-111	6	10	6	3
110-106	14	19	16	19
105-101	27	28	23	25
100- 96	35	33	34	35
95- 91	22	25	25	21
90- 86	12	11	13	15
85- 81	8	5	11	6
80- 76	5	3	2	2
75- 71	2	2	1	2
70- 65	1	1		
Total	134	139	133	130

The correlation of the above tests with teachers' estimation and with the national intelligence tests modified by the author will be reported later.

BOOK NOTES

The Mind in the Making: the Relation of Intelligence to Social Reform. By James Harvey Robinson. New York, Harper and Brothers, 1921. vi + 235 p.

Perhaps the most conspicuous and significant fact about the study and teaching of history today is the general effort among the younger and more progressive historians to break away from the episodical and anecdotal tendencies and to have less and less confidence in the efficacy and sufficiency of the political narrative. In the place of these older methods and practices there has been substituted an ever growing interest in the history of civilization and in the genesis of the various aspects of human culture. Among these many diverse and promising manifestations of an interest in a more dynamic and consequential type of history, none is more potent for good than the impulse to a consideration of the intellectual history of mankind.

The possible significance of the promotion of intellectual history has been grasped by penetrating thinkers since the opening of the seventeenth century. In his "Advancement of Learning" Francis Bacon stated that: "No man hath propounded to himself the general state of learning to be described and represented from age to age, as many have done the works of nature and the State civil and ecclesiastical; without which the history of the world seemeth to me to be as the statue of Polyphemus with his eye out; that part being wanting which doth most show the spirit and life of the person." Dr. Samuel Johnson in his "Rasselas" held that: "There is no part of history so generally useful as that which relates to the progress of the human mind, the gradual improvement of reason, the successive advances of science, the vicissitudes of learning and ignorance, which are the light and darkness of thinking beings, the extinction and resuscitation of arts, and the revolution of the intellectual world." The development of evolutionary thought in the last century made it plain that the human mind was a product of natural genesis in the same manner as the human body. This fact was made the basis for the notable science of genetic psychology, founded and developed by G. Stanley Hall. Genetic psychology may well be regarded as the indispensable scientific prolegomena to intellectual history. The progress of social psychology from Hume and Comte onward has emphasized the generation and significance of collective and mass thoughts and opinions as an expression of the culture of a given era. This has been appropriated for progressive historiography by Karl Lamprecht and his followers.

While such influences as have been enumerated above have produced the foundation for intellectual history, and while many historians have contributed much important literature to the field, the isolation and demarcation of the province of intellectual history and its organization into a coherent whole have been the achievement of Professor James Harvey Robinson. A prospectus of his conception of the field is to be obtained in his syllabus, "A History of the Western European Mind," gradually developed and elaborated to meet the needs of his classes in intellectual history at Columbia University and the New School for Social Research.

In even the earlier editions of his syllabus, published ten years ago, Professor Robinson promised a comprehensive manual to cover the field of intellectual history. This has long been awaited by his students and disciples, and the present work, delivered originally as the Kennedy Lectures before the New York School of Social Work, is to be regarded as the first preliminary effort at fulfilling this promise. As an intellectual history of Europe the volume is pathetically inadequate, but as an effort to present the leading generalizations which might be drawn from a long and assiduous cultivation of the field of intellectual history the book is nothing short of a magnificent achievement. Indeed, it is the calm and deliberate judgment of the reviewer that no other book by an historian can be said to equal this one as a presentation of the more significant generalizations of history for the use of thoughtful citizens. From this standpoint Wells's "Outline of History" becomes insignificant and sophomoric by comparison. As a withering attack upon the conventional utilization of history to justify anachronisms in our own civilization the book is both unrivaled and invaluable.

The material in the book is arranged according to the consideration of the following topics: the futility of past efforts at reform because of an ignorance of the mechanisms of the human mind; the chief types of thinking, with special reference to the contrast between secondary rationalization and creative thought; the development of the human mind in its thought content from the animal stage to that manifested in contemporary civilization; the indictment of the capitalistic-nationalistic-pietistic "acquisitive society" of the present day; and an analysis of the bearing of a review of the genesis of the modes of human thought upon the problem of social reform in its widest implications. Throughout the book there is always evident an effort to show the relation of the facts of psychology and history to the present and future of human society. Yet there is no attempt to advocate any special type of reform measure. Indeed, so great is the detachment from propaganda that one eminent reviewer of the book has accused Professor Robinson of playing the rôle of Achilles in his tent.

The significant message of Professor Robinson's volume may be epitomized in the following manner. The basic need of today is to bring our thinking in the field of the social sciences up to the same level of scientific objectivity that now prevails in the realm of the natural sciences. Mankind has experimented unsuccessfully with three methods of reform, namely, tinkering up social machinery, moral uplift, and education through inculcation of "the collective wisdom of the past." We can understand why these have failed only by an investigation of the prevailing modes of thought, their genesis and method of operation. We tend to respect and remain satisfied with the so-called "wisdom of the ages," though every forward step taken by the race has been in defiance of this moss-embellished sagacity. This we do because most of our thinking is derived from a subconscious level, where instinct, habit and tradition dominate. Most of our "basic principles" of conduct are but secondary rationalization of primitive reactions. Our only escape is through the stimulation of creative thought, based upon the experimental and pragmatic method. Yet creative thought is obstructed on every hand by many forces, the variety and potency of which can only be understood after a review of the history of the chief stages in the formation of our present mental content and psychic operations. These stages are those of the genesis of our animal mind, the development of our savage mind, and the formation of our traditional civilized mind. Man's long period of existence as an animal developed in him the variety of instinctive reactions which he possesses, the method of learning by trial and error, and a certain docility and intellectual inertia. The period of human savagery was far longer than that of civilization, and has left its indelible impress upon our modes of thinking. It generated our animistic and mystic tendencies, our strange deference to authority, and our unbelievable conservatism. Most of the basic elements in our religious and ethical beliefs date from this stage of human psychogenesis. Taboos, ideas of "principle," symbolism, notions of the "sacred," and dream-logic are some of the more conspicuously powerful vestiges of savage thought which still remain to plague our civilized age.

The background for the emergence of a civilized mind was provided by the Egyptians, who invented writing and many practical arts, by the Babylonians, who excelled in commercial life and in astrology, and by the Hebrews, who developed to an unusually high degree the religious views they had drawn from a primitive era. Working on these and additional data the Greeks first evolved creative thought. "They discovered skepticism in the higher and proper significance of the word, and this was their supreme contribution to human thought." But the Greek intellectual life tended towards metaphysical abstractions and away from experimental and applied science. When the possibilities of metaphysics were exhausted, Greek thought inevitably entered into a period of stagnation and decay. The medieval age brought with it intellectual reversion and deterioration. Christianity, aided by Neo-platonism and the Oriental mystery cults, substituted faith and emotion for reason and critical thought. A definite scheme of creation, life and ultimate destiny was elaborated into a divinely authoritative epic, belief in which was enforced by the powerful Roman Catholic Church. Man was significant only as the possessor of an immortal soul to be saved from eternal torment. The monks and Augustine introduced and established in European intellectual and ethical tradition that impurity complex which, with additional impulses from Protestant Puritanism, has served to prevent any scientific consideration of the problem of sex, right down to our own day. An extensive system of secondary rationalization, supplying an elaborate and sophisticated explanation and justification of these primitive reactions on metaphysical grounds, was provided by the Scholastic philosophy, which culminated in Aquinas. The medieval age added little or nothing of a progressive nature to the thought of the Greeks, but rather revived a vast mass of primitive superstitions which have survived to obstruct the critical and scientific thought of the modern age.

Our modern civilization has been an outgrowth of a totally new type of thinking, which was partially foreseen by Roger Bacon and definitely heralded by Francis Bacon—critical thought and experimental science. This was on all points opposed to the dialectical method of the Greeks and Scholastics, and has proceeded on the notion that "nature is more subtle than any argument." Though opposed by the Church and long by professional scholars, it has triumphed and made possible an entirely new material world through its applications to industry. Yet the great potential benefits of modern applied science have been but very partially and imperfectly realized, owing to the lack of adequate development of moral and social control over the new technique, which is in danger of developing into a Frankenstein monster. The two chief obstacles to a proper socialization of modern applied science are the profit making objective of all modern economic life, and modern nationalistic patriotism, which diverts so much human energy and wealth into processes of mutual destruction. But those in control of modern civilization believe that they stand to gain by the modern theory of business enterprise and by unreasoning patriotism. Hence, they oppose all efforts at reform under a mass of secondary rationalizations known collectively as "the philosophy of safety and sanity." The challenge of the world war to the old social order increased the activity of its guardians, and we have had as a result the Palmer inquisition, the Lusking of New York State, and the "law and order myth" associated with Governor Coolidge of Massachusetts. Yet, if history proves anything it is that excessive repression of progressive tendencies is as ill advised on the part of the vested interests as it is detrimental to society at large. Stupidly thorough repression merely postpones change, makes it violent and expensive, and costs the vested interests more dearly in the end. Conservatism is partially a savage and primitive trait and partially a sort of collective neurosis through which mechanism the guardians of the existing order seek to avoid facing the social realities of the present day.

Without bravely facing these realities which demonstrate the "sickness of the modern acquisitive society," however, we cannot hope to improve our social order. With the gradual elimination of the belief in the providential nature of social causation and supernatural interference with human institutions, we have come more and more to see that our civilization will be neither better nor worse than we will that it shall be, that man holds his destiny in his own hands. Until the leaders in modern society fully recognize this fact and intelligently accept the responsibility which this carries with it the "race between education and catastrophe" will continue, with the odds wholly favoring catastrophe.

Professor Robinson's book is an eloquent appeal to social initiative, but one feels that it will be read only by a small minority of the population and appreciated only by a small percentage of those who read it. In the meantime the guardians of the modern order and the masses who support them will continue to trust in "the tried wisdom of the ages," the "findings of mankind," "the sturdy virtues of manhood and womanhood," "the sagacity of the Fathers," the "hard sense and practical shrewdness of the modern business man," and "the adroitness and astuteness of the modern politician and diplomat." The outlook is not entirely encouraging or wholly conducive to optimism, and Professor Robinson's book is a convincing demonstration that one can derive little assurance or comfort amidst the novel and diverse problems of the modern age from the perennial conservative rejoinder that somehow things have always come out all right in the past, in spite of the calamity howlers of earlier ages.

Harry Elmer Barnes, Clark University.

Two New Journals: 1. *Archives of Occupational Therapy*. Edited by Wm. R. Dunton, Jr., M. D., Sheppard and Enoch Pratt Hospital, Towson, Md. Bi-monthly. No. 1, February, 1922, 98 p.; No. 2, April, ending p. 170.

2. *Journal of Personnel Research*. Vol. 1, No. 1, May, 1922. 51 p. Monthly.

The first of these journals is intended to be a circular organ for literature bearing on its subject and represents the American Occupational Therapy Association. The leading article is by Adolp Meyer on the "Philosophy of Occupational Therapy," and other articles are "Training Aides for Mental Patients," "Trend of Occupational Therapy for Tuberculosis," "Recreational Therapy for Heart Disease," "Occupations for the Home-Bound," "Children in Hospitals," "Jewelry Making," "Work of the Tide-Over League," "Psychiatry and Occupations." The type, paper and get-up of the *Archives* are attractive. The type is large, and the lines run across the page. The get-up of the second journal is less attractive, and the type is smaller with two columns on the page. The first number contains three articles: "Reasons for Personnel Research," by J. R. Angell; "The Development of the Personnel Research Federation," by A. D. Flinn; and "Basic Experiments in Vocational Guidance," by C. S. Yoakum. The latter gives most attention to book reviews, notes and abstracts. Both journals somewhat overlap the field of the older *Journal of Applied Psychology*, now in its sixth volume.

Health and Social Progress. Rudolph M. Binder. Prentice, Hall, N. Y., 1920. 295 p.

This admirable work strikes the right note, showing the relation between health, civilization, religion, etc., with sections on health in Ancient Greece, Rome and the tropics, its bearings on world progress, originality, etc. Civilization is the product of healthy people, and most leaders have had exceptional vitality. Genius consists in making syntheses or, in Kant's phraseology, organizing the maniform under some unifying principle. Health is not necessarily identical with athletics. It may involve ability to resist small and constant ailments, which is a better measure of health and vitality. Success involves constant effort along a particular line with strain on a particular organ and so is apt to be more detrimental than general physical labor. The general neglect of the commonest rules of health by workers makes a sad chapter. The author illustrates his thesis, which maintains that ability, vitality and even longevity go along together, by many individual examples. Genius is ourselves raised to a higher power. Very many people have assumed that society must be transformed rapidly and completely, but it is a colossal task. The traits of genius are that it strives for the *accessible*, knowing the capacities and limitations of human nature. Hence, it is adaptable. Another of its traits is *objectivity*, and yet another is youth. The objective genius requires a certain degree of maturity as the subjective or verther type does not. But as life grows complex, it becomes necessary to create by reassembling in one organism the scattered members.

Men and cattle will be adapted to lower latitudes. Telic civilization is taking the place of genetic development. Gorgas said civilization is drifting back to the tropics. Genius gives the world the vital ideas which make civilization possible. It is within our powers to turn our whole social destiny back to the paths of health, and, in the new era just ahead, health will be considered of prime importance.

Universities and Scientific Life in the United States. By MAURICE CAULLERY. Harvard University Press, Cambridge, 1922. 269 p.

The author was exchange professor at Harvard during the war and in 1916 spent five months in travel and study to prepare this book. It was addressed mainly to France, and the many suggestions to reform make it seem often a little critical of her institutions. Most of its data are familiar enough to American educators, but the comprehensiveness of its survey and the admirable perspective which it affords make it the best general picture of higher education in this country which we have today. The author is a biologist and treats this subject more fully than any other, as might be expected. He has great sympathy with research and describes the American university as like Milton's "tawny lion pawing to get free" from the older college from which it sprung. He includes, also, general views of the relations between the faculty and the president, a theme which perhaps reached its highest point of interest when he was here. He is an ardent advocate of academic freedom, of the autonomy of faculties and even departments. His book, of course, does not include any account of the upheavals and transformations of American universities due to the war. Indeed the history of these last few years could hardly be written yet, because we are in the midst of changes probably far more revolutionary than we now realize and the view of which cannot yet be forecast. The author is especially interested in the new rapport between the academic institutions of this country and of France and would be glad to see American graduates flock to his country as they formerly did to Germany. But the implications as to the relative state of academic work in the two countries will hardly be to favor graduate study in France.

The Psychology of The Other One. By MAX F. MEYER. Missouri Book Co. 439 p.

A Brief Manual of Psychology Demonstrations. By MAX F. MEYER. 108 p.

These little hand-books show how for some twenty years the author has taught psychology to freshmen. His methods of approach are perhaps most original and challenging to current methods that we have had in this country since psychology became a science and should be carefully considered by all instructors throughout the land who face the problem of teaching beginners. His standpoint is characteristic in the sense that the author does not believe in soul as an independent entity, but stresses physiological functions. It is almost the reverse of introspective in that the author does not make consciousness the supreme oracle, but gives a large recognition to the unconscious, without being in any sense Freudian. "The Other One" is partly the submerged part of the soul, but is to be studied objectively in the other member of the pair with whom each student is associated. Thus we are told: How the Other One becomes an object of interest to us; How it manifests active reactions; How it appears now attentive and inattentive; Learns; Wills; Evolves from anatomical functions; Reflexes its dormal activity, space perception, reaction to spectum and signals; Talking machinery; Rhythm; How the Other One acts if born blind or deaf or walks in sleep; with a final chapter on mysteries of the soul, like hypnotism, religion and politics.

This work is deserving of a far fuller notice as a pedagogical novelty in the field than this journal can give it.

Sex Searchlights and Sane Sex Ethics: An Anthology of Sex Knowledge. By Dr. Lee Alexander Stone. ($7.00.) Science Publishing Co. 1922. 779 p.

This is a very comprehensive work treating of Reproductive Function and its Organs; Physiology and Psychology of the Reproductive Organs, Puberty, Continence, Masturbation, Impotence and Sterility, Sex-Eugenics-Heredity, How to Love, Marriage, Birth Control, The Limitation of Offspring by the Prevention of Conception, Sex Facts for the Male, Advice to Girls Approaching the Threshold of Womanhood, Sex Facts for the Married, Menopause, Pregnancy, Abortion, Syphilis and other diseases, Prostitution and Segregation, Quacks and their methods, Modesty and Prudery, Sex Education at Home and in School, Sexual Hygiene, If Every Man Were Straight, Are Children Getting a Square Deal, Sex Searchlights, Sex Tragedies, Selected Poems, Glossary and Bibliography.

There are several score of illustrations, including photographs of epoch-makers, of normal and abnormal organs, and what seems in shocking taste—a number of cartoons with an evident and earnest moral purpose, but which to our mind give the book an almost vulgar aspect to those who thumb it through for the first time. The author avoids everything pantographic and shows himself not only a man of science, but a reformer. It is high time we had a book of this sort, but we wonder whether the author has not attempted the impossible, viz., to appeal at the same time to experts who want authorities and to the public which needs incitation to virtue and to be warned against vice. We wish the author had come to terms more closely with the Freudians. Some of his twenty-nine chapters might have been written in a pre-Freudian age.

La Technique Educative. By Jean Devolve. Paris. 319 p.

The author here attempts a kind of pedagogic organon and discusses both intellectual and moral pedagogy, the technique, demonstration and social factors of moral education. He lays stress upon the questionnaire as a guide for observing moral character of children in school and discusses the pedagogic idea of attention. In the second part he discusses the pedagogic movement in literature, the auxiliary sciences and goals of education, and in the third part he treats upon the application of these principles to teaching in France, discussing moral training of public schools and universities of that country, with special attention to recent literature on the subject, finding that these problems have taken a new aspect since the war.

The Transactions of the Institute for Child Study. Edited by Yoshihide Kubo, Ph. D. Tokyo, 1922. 316 p.

This stately volume in Japanese contains articles on: Revised and Enlarged Methods of Measuring the Mental Ability of Children; Lung Capacity of the Students of Various Girl Schools; Mental and Physical Development on entering School; Temperature of the Body, Pulse and Respiration of Kindergarten Children; Development of language of pre-School age children; Mental Tests for Kindergarten Children; Arithmetical Ability of Children; Distribution of Intelligence of the First Grade Children; with an Abstract of Foreign Publication on Child Study.

The many cuts and tables suggest various new devices.

The Dalton Laboratory Plan. By Evelyn Dewey. Dutton Co., N. Y., 1922. 173 p.

The plan itself is first described, then the laboratory, the assignments, the Dalton high school, opinions of teachers and pupils, the children's university school, and the need for an improved education. This plan, developed by Miss Helen Parkhurst, makes the children the experimenters and the instructors observers who should be ready to serve the community as their special talents are needed. They study children to find the environment to best meet their needs. The mind is not jerked from one subject to another arbitrarily, for this interrupts the natural and ordinary mental processes imposed by the organization of the program. A secondary school used this plan in England as a unit of 110 pupils per teacher, and Miss Parkhurst believes that the teacher can meet 200 pupils as well. The change of teachers, too, is minimized. The school year is ten months, and there is no time schedule or bell to summon from one room to another. Thus the children enjoy a larger world, and the laboratory approximates life in the community, giving great range to individual differences and breaking up lockstep.

The Elementary School Curriculum. By Fred. Gordon Bonser. Macmillan Co., N. Y., 1922. 466 p.

The first eight chapters develop principles relating to life activities and children's needs, while the second part applies these to constructive curricula in different subjects, Geometry, Arithmetic, English, Music, etc. The work gives due recognition to the project plan, is social and pragmatic. The book is far less revolutionary than its preface induces us to expect.

Science and Common Sense in Working with Men. By Walter D. Scott, N. H. S. Hayes. Ronald Press Co., N. Y., 1921. 154 p.

The authors claim a new point of view in dealing with men in industry. They should no longer be regarded as so many kilograms of energy nor from the paternalistic standpoint, but as individuals to be tested, mental and physical and theoretical ability, and who should have their characteristic qualities rated, their history taken into account, as well as their instincts. We must remember that opportunities are changing and that adjustment is a continuous process.

The Johns Hopkins University Studies in Education, No. 4: The Effect of the Physical Make-up of a Book upon Children's Selection. By Florence E. Bamberger. Johns Hopkins Press, Baltimore, 1922. 162 p.

The experiments here, mostly in Teachers College, were also chiefly on children of the first to the third grade. They actually picked out different editions of the same book and then gave the reasons for their choosing. The conclusions are brought out with needless methodic pedantry and elaboration with curves and tables galore. The conclusions, however, and the methods should have been found more concisely set forth. These conclusions are that the make-up of a book influences selection, so do the cover, the title, and that the externals of a book may be negative in their influence, etc.

A Socio-Psychological Study of Fifty-three Supernormal Children. By WILLIAM T. ROOT, Jr. Monographs, Psychological Review Company, N. J., 1922. 134 p.

This is a study of fifty-three supernormal children, all with one exception between the ages of seven and sixteen, all Caucasian and speaking English fluently. This study is of unique interest, not only because of its subject, but because in its thirteen pages of "Conclusions" the author gives somewhat free scope to inferences which, although somewhat speculative, are at the same time highly practicable. He recognizes, too, the limitations of this method and, better yet, the vast number of factors included and the very wide range of individual variations. It would seem as though this author, unlike many of the "testers" and despite his complicated technique and elaborate and, to our thinking, for the part not very valuable tables, was nearer than most to the recognition that the next step in this whole movement should be the very minute and painstaking study of single cases. With the exception of one excellent report of this kind by Terman, the writer of this note knows of no exhaustive analysis of a single case such as the few that have characterized and perhaps constituted the most important part of the Freudian literature, e. g., the Irma, Dora and other cases. Something like this is surely next in order.

The Psychology of Arithmetic. By E. L. THORNDIKE. N. Y., Macmillan, 1922. 314 p.

Psychology has lately shed much light on the process of learning, and it has itself learned to measure the amount, rate and conditions of improvement, while we have obtained better understanding of the so-called higher processes of analysis, abstraction, the formation of general notions and of reasoning. This book presents the application of the newer dynamic psychology in the field of arithmetic. In fifteen chapters, with selected bibliographies, the subject matter is presented in very great detail with many diagrams and tables and the characteristic stress laid upon methodology. Whether the author has brought the intricate subject matter within the range of a teacher of arithmetic and whether it will ever much affect presentation will be doubted, but it is at any rate a very interesting contribution to psychology.

What Is Social Case Work: An Introductory Description. By MARY E. RICHMOND. N. Y., 1922. 268 p.

In this excellent little book, the author describes not only the work but the spirit of the "straighteners," and gives the general principles of case work. This ranges all the way from insightful suggestions and social readjustments to a complete change of environment. The end always is improvement of social relations and the development of personalities. Officialism is to be avoided. Joint programs are often useful. Human beings are interdependent, and the work begins in the family or home and has its own corps of experts, but must be given as wide correlations as possible.

The Cure of Imperfect Sight by Treatment without Glasses. By W. H. BATES. 1922. 313 p.

This opthamologist polemizes against glasses. He would give the eyes occasional rest by pressing and slightly massaging the eye balls with the palms of both hands to give absolute darkness, which closing the lids does not give; also by periods of very acute fixation; third, by recalling vivid optical memories; and fourth, by developing "eye-mindedness" by intensive use of the visual imagination.

L'Evolution Psychologique; et la Littérature en Angleterre. Louis Cazamian. Paris, 1920. 268 p.

The author gives a very interesting sketch of what might be called belletristic literature in England from the time of Elizabeth to the present, with special chapters on "Literature of the Restoration," "Classicism," "The Moral and Social Aspects of Romanticism," "The Transition to the Neo-Classic and Neo-Romantic Age," showing in a general way how English literature has been progressively affected by psychologic and philosophic thought, the two not being very clearly distinguished. Very interesting is his verdict concerning Samuel Butler, George Eliot, William Morris, the Brownings, Rossetti and Swinburne, to each of whom he gives considerable space. He does not come down to the living present, and we look in vain for his verdict concerning contemporary authors.

How To Measure in Education. By WILLIAM A. McCALL. N. Y., Macmillan, 1922. 416 p.

The author treats how to use measurements, how to construct and standardize tests; tabular, graphic and statistical methods; and under these three divisions has seventeen chapters, 48 tables and 25 diagrams. He tells us that the science of measurements is in its infancy, while as an art it is younger still; that measurements of children have come to be the most dramatic tendency in modern education. In fact, the study has become one of the distinctive features of American education. The demands have been so great that the effort to meet them has resulted in almost feverish effort. The author attempts (1) to present the successes and warn against mistakes; (2) to help on the movement of making teaching a genuine profession; (3) to meet the needs of educators interested in both the how and the why, and finally to bring together most of the techniques needed by those who engage in this work. It is both autobiography and biography, the first because he spent so much time in Teachers College, which is the best laboratory for this kind of work, and biographic because he sees the tangible evidence of his many teachers, viz., his pupils, to whom he makes due acknowledgments.

The Introduction to the Study of Language. By LEONARD BLOOMFIELD. Henry Holt & Co., New York. 335 p.

The author is associate of Philology at the University of Illinois. There is no indication as to when the book appeared. It has just come to our hands, but the references to literature are certainly not up to the present date. The author avowedly follows Vunt in his psychology. His treatment of child langauge is most superficial, and he has no adequate conceptions of the contributions to his subject in this field. He is strong on the physical and phonic bases of language or its morphology.

Peace and Bread in Time of War. By JANE ADDAMS. The Macmillan Co., N. Y., 1922. 257 p.

Miss Addams here gives a very frank and more or less autobiographical account of a small group of women who before and during the war tried to develop the influence of the Women's International League for Peace and Freedom. She tells the story of the Ford ship, Wilson's policies, bread rations, women's traditions, speculates on bread, liberty and war slogans; gives her personal reactions in time of war; its aftermath; her experiences in Europe during the armistice and after two years of peace. It is the hunger and starvation caused by the war that appealed most strongly to her.

Intelligenz und Begabungsprufungen. By DR. J. SUTER, Privatdozent in Zurich. 174 p.

This volume treats of the present status of tests for ability; the method of psychological experiment; tests of thought, fancy and memory; methods of testing accuracy of vision, of tactile discrimination, shortness and rapidity of movement; vocational tests with bibliography.

Handbuch Psychologischer Hilfsmittel der Psychiatrischen Diagnostik. By Otto Lipmann. 1922. 296 p.

There are seventy-two topics here treated, such as: Counting, Arithmetical Tests, Reading, also with inverted page and from right to left, Writing, Drawing, Recognition, Imitation, Natural Intelligence, Rapidity, Accuracy, Instruction, Permutation, Filling of Gaps, Making Abstract into Concrete, Opposites, Subordinate Ideas, Parts and Wholes, Vocabularies, Situations, Curve of Work, Einstellung, Series of Rhythm, etc.

Ten Little Lessons on Vitamines. By Eugene Christian. Westfield, Mass., Vitamine Research Association.

These are on the Background, History, a Step Nearer the Mystery of Life, Deficiency Disease, Infancy, Relation to Children's Health and Growth, Health of Men and Women, How to Preserve the Vitamine Content of Foods and Healthy Teeth.

Modern Educational Series. Compiled by R. D. PATEL, Rajkumar College, Rajkot. 1921.

These eight pamphlets, *circa* 100 pages each, are respectively on Art and Industrial Training, Moral Instruction and How to Impart It, Popular Education and National Prosperity, First Steps in Evolution, Intellectual Culture or The Pleasures of Science, Claims of Science in National Life.

Die Grundlagen der Psychischen Entwicklung Eine Einführung in die Kinderpsychologie. By K. KOFFKA, 1921. 278 p.

After discussing problems and methods, subsequent chapters are devoted to general viewpoints and facts of development, to point of departure, special tendencies of psychic development, problem of memory in child in outer world.

Studies in Infant Psychology. By JOHN B. AND ROSALIE RAYNER WATSON. *The Scientific Monthly*, Dec., 1921.

This valuable contribution, made on new-born infants in the lying-in hospitals, considers grasping, reaching, right and left handedness, early eye movements, the Babinski reflex, sitting alone, with notes on experimental study on emotional life—fear, rage and love. Tests are carried on to the age of nearly one year.

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A STUDY IN CIVIC TRAINING

By GEORGE ALLEN COE

I

School education tends to overestimate the importance of instruction and to underestimate the value of training. William James, some years ago, said, in a public address:

> "There is not a public abuse on the whole eastern coast which does not receive the enthusiastic approval of some Harvard graduate. Fifty years ago the schools were supposed to free us from crimes and unhappiness, but we do not indulge in such sanguine hopes to any extent today. Though education frees us from the more brutal forms of crime, it is true that education itself has put even meaner forms of crime in our way. The intellect is the servant of our passions, and sometimes education only makes the person more adroit in carrying out these impulses." (Quoted by C. A. Ellwood, *School Review*, 15:544.)

Instruction may or may not establish a proper attitude toward a matter under consideration, but the essential thing after all is just this establishment of attitude—of truth seeking, of aggressive activity, etc.—rather than only mastery of subject matter.

We cannot tell just how far knowledge affects attitude. A group association test of forty stimulus words taken from civics was given for this purpose to 347 pupils in the schools of Grafton, Gloucester and Pittsfield, Mass., ranging in age from ten to eighteen years. This test we shall call Group Association Test Alpha. The words were so chosen as to not only reveal knowledge of civics but also to show either an attitude of public spiritedness on the one hand or relative indifference on the other. The methods of handling this test and of interpretation of results were like those used in connection with Group Association Test Beta and will be fully described later in connection with the latter. A fair degree of

Group Association Test Alpha

Your first and last name . . . .

Your age on your LAST birthday . . . . Boy or girl . . . .

Your grade in School . . . .

Below you will see a list of words. They all have to do with civics or public affairs. Most of them you understand. After reading each word please place in the next column, directly opposite it, some other word which it suggests to you. If you do not understand any word just put an X opposite it and pass on to the next word.

So as to make the matter clear to you I have already done the first three. WATER made me think of how clear the water is that I drink, so I wrote CLEAR in the next column, directly opposite water. ELECTION made me think of the place where I vote, a POLLING-BOOTH, so I wrote in the next column, directly opposite ELECTION, the word POLLING-BOOTH. LOYALTY made me think of a very loyal friend, so I wrote the word FRIEND. You do the remaining seven words.

WATER . . . . clear . . . .

ELECTION . . . . polling-booth . . . .

LOYALTY . . . . friend . . . .

GRAFT . . . .

FLAG . . . .

GOVERNOR . . . .

NAVY . . . .

APPROPRIATION . . . .

VETERAN . . . .

JUDGE . . . .

When you have finished these hold your pencil up and await the word to turn the page. On the following page there will be other words of the same kind and you are to do the same with them.

Do the same with these words as you did with those on the preceding page.

ARMY..........
VOTE..........
EDUCATION..........
TAX..........

LAW..........
MONEY..........
HEALTH..........
MONOPOLY..........

SOCIAL..........
RECREATION..........
COUNTRY..........
WAR..........

FORESTS..........
CONTAGION..........
IMMIGRANT..........
WAGES..........

WELFARE..........
LIBERTY..........
SERVICE..........
DEMOCRACY..........

COMMUNITY..........
CITIZEN..........
SAVINGS..........
PRIVILEGE..........

COMMERCE..........
SELECTMEN..........
PRESIDENT..........
BONDS..........

TREATY..........
LOAN..........
POSTMASTER..........
IMPROVEMENT..........

STRIKE..........
PENSION..........
TREASURY..........
TRUST..........

COURT..........
HIGHWAY..........
WARRANT..........
CABINET..........

When you have finished put your pencil down and await further directions.

correlation was noticeable between the civic intelligence evidenced by intelligible reactions and social or public-spirited responses (r = .39, p.e. .031), but the increase in the number of public-spirited or social responses did not compare favorably from age to age with the rate of increase in civic intelligence; nor was there an appreciable increase of public spiritedness or sociality with age.

Figs. 1 and 2 and Table 4 show the results in detail.

ASSOCIATION TEST ALPHA

I=INTELLIGIBLE REACTIONS
S=SOCIAL "
A=AGE

r_{si}=.39, P.E. .031
r_{ai}=.59, P.E. .024
r_{sa}=.15, P.E. .035

FIG. 1

Progressive schools have afforded us, recently, a better foundation upon which to build. The boys of the McDonough School (23, 250) demonstrated the capacity of pupils to work out complicated problems of government. This kind of practice, coming at a period in the child's development when he is highly receptive, may be the source of much wisdom and social balance in later years. Our most dangerous radicals as well as our worst ultra conservatives are not infrequently excellent students of civics, but they are often lacking in the discipline of experience such as the McDonough School afforded.

In contrast with the McDonough School, where the boys were actually making their own laws, is the school at Abbotsholme, under Dr. Reddie, where the boys were not allowed to govern themselves to the same degree but were trusted to control themselves in accordance with the rules of the school. Even in such a case there is opportunity for experience to operate as a disciplinary factor. The essential thing is that whatever responsibility is placed upon the pupil should be genuine. Whether it be considerable or not is relatively secondary.

Better known to us is the Moraine Park School, at Dayton, Ohio. This school constitutes in the words of Stanwood Cobb (9) "A wonderful demonstration of freedom, backed up by efficient work as proved in standard tests." The aim here is to develop attitudes. Student self-government prevails and citizenship is learned by practising citizenship. The pupil is self-supervised, and learns to govern his own comings and goings. The governmental machinery consists of a community meeting and a commission form of government with a community manager, under whom there are departmental directors. Project work and measurement of pupils according to degree of mastery of the "arts of life" instead of by subjects is a further aid in establishing attitudes of social value.

Still different is the Francis W. Parker School of Chicago, which provides a rich community life, where education is regarded as a preparation for citizenship and social co-operation. Here, too, we find student government, but, more important, social production as well. This latter is secured by group project work. Each child's work is regarded as a contribution to the group. No marks are given. Attention centers on results rather than on rewards.

These schools are typical of others which are not so well known. They are far ahead of most experiments with school cities, republics and the like, which, as ordinarily organized and conducted, have little other than dramatic value. For citizenship training it is not essential that activities in which the pupils participate be of a political or civic nature. It is rather desirable that the school work be so organized and the program so arranged as to allow a large amount of latitude and freedom and ample opportunity for essentially the same kind of relationship that exists between most adults. We are not attempting to train policemen, mayors, congressmen and the like, but citizens. Citizens must know how to live together and work together in homely fashion, meeting on all levels and in every kind of activity. No one activity has much greater civic training significance than another *per se*. It is rather the degree of co-operation and mutual interest in all activities which is significant. Colin A. Scott has, therefore, been advocating for years the formation of groups, which groups would be analogous to the new relationships in which one finds oneself involved in ordinary society.

"We do not find people in offices and parlors getting up and asking questions to which everyone knows the answer, or is expected to feel disgraced if he does not. The individual who should become seriously enamored of the ordinary school practice would find little room for himself in the world of real life. The particular things that are done in school do not cultivate even a working majority of the habits of action which are used in the world at large. This is not because the habits of action of the school are superior to those of the world, but simply because they are narrower, and better suited as a preparation to the life of a primitive clan than to that of a highly differentiated society. They are the result of the pressure of the causal forces of society, passed on by the teacher without consideration of the actual effects which are being created in the social organism of the school itself.

"In real life, on the contrary, society at its best organizes in groups in which each individual in the various groups to which he may belong, finds himself in contact with others whose weaknesses he supplements or whose greater powers he depends upon. The idea of such a group as a whole is not necessarily contained in the brain of any single member, and as the idea developes by social interpenetration it becomes, in all its many-sidedness, too large for any member to contain. The function that each plays is a different one, and the thought of each concerning the group is likewise different. And yet such groups tend to stick together. They exercise some form of moral restraint or attraction upon their constituents, who yield them an obedience sufficient to maintain their cohesion for years, and sometimes for generations. If the school is to prepare for society as it is, it would be natural to expect that some such form of social activity, however embryonic, should be found as a necessary feature of its life.

"This, however, is a feature of organization that cannot come from the direct impact of outside pressure. Neither society as a whole nor its personification in the teacher, can say: Go to; let there be groups. Let us put so many in one group and so many in another. Let us select individuals according to their capacities and give them work that will be suited to their needs. No, a real social group cannot be reduced to a mere instrument of the teacher, a means or a method for accomplishing certain preconceived purposes. It is necessarily too manysided for that. Nor can the constraint required and the obedience developed originate from the outside of the group. It must be a part of its own specific constitution and necessary to its maintenance. The group must be capable of going to pieces, a thing it cannot do if it is to depend on the authoritative backing or the constraint of the teacher. Indeed it is only when it can go to pieces that there is any reality in the effort to hold it together. It is only then that there is any true loyalty developed. It is only then that its members feel the characteristic group restraint, and submit their private wills for the good of the whole. True responsibility, and even obedience of the highest type, is felt only when the group as a whole is free." (31, 15.)

Group work, but not as free as that proposed by Scott, has been utilized by Kerschensteiner, in Munich. Kerschensteiner, in his industrial school, has aimed at the creation of an *Arbeitsgemeinschaft* or community of workers. His idea is to apportion all the work of the school out to groups of say four, six or eight pupils, holding the group rather than the individual responsible for the results obtained. He believes that the group will exercise a sufficiently strong pressure upon the individual so that he will be forced, in a natural and usual way, to discharge his responsibilities. To quote:

> "Another moral quality, especially in regard to the best pupils, is put to the test in a way that is impossible in our present school system. I mean the consciousness of responsibility. Not only the leaders of the separate groups but each member of them is daily made aware of the fact that the work done is of importance for him as an individual, but also goes to make or mar the quality of the work of the whole group. Our present day schools are hardly able to awaken the pupil to the idea of responsibility; far less are they able to produce in him a real, live feeling of responsibility." (21, 43.)

Kerschensteiner admits that we should not form such communities or groups before the pupils reach a sufficient degree of maturity. He also plans to guard against binding together in groupings community elements which are too widely different in capacity. In order to take care of those who possess unusual abilities he would place them in groups by themselves so that more might be required of them.

Kerschensteiner's experience has led to the conclusion that this group work has a desirable civic result and he regards such education as specific training for citizenship. His work, however, differs from Scott's plan in that Scott feels that the work should be self-organized. Scott reports the self-organized group work of pupils in an interesting instance. (31, 106.) Parallel to this I am able to report from my own observations a mixed first and second grade class which enjoyed, several times daily, a "free period" during which they were allowed to do anything they wished. They broke up, most of them into groups, though a few remained by themselves, and engaged in multiform activity, such as games, drawing upon the blackboard and construction work of various kinds, but invariably doing something of value and as invariably carrying on their activities in such a way as to not disturb each other. The room could not be quiet under these conditions, but it was orderly. The general atmosphere of consideration for each other was better than I have seen prevail at some teas. Scott also shows (31, 110) at some length, how homogeneous groups can and do exert sufficient pressure of a social nature upon their members to serve as a positive disciplinary force. This is in reinforcement of Kerschensteiner's observations.

II

A number of experiments have been made which indicate clearly the stimulating effects of the group upon the individual. The first of these appears to be that the group constitutes a stimulus to greater productivity. (3.) Mayer (26) in dictation, mental and written arithmetic, memory tests and combination tests, found that twenty-eight schoolboys averaging twelve years of age were able to work more quickly and do better work in groups than alone. Triplett (34), working with forty children, found that they turned a reel more rapidly, though in some cases not as economically of effort, when they worked in the presence of another child than when they worked alone. Moede (28) more recently, experimenting with rate of tapping and with the ergograph, secured better results in group work than with the individual. In experiments with arithmetic he obtained no better average from the group work but the average deviation from the central tendency was reduced. Moede also found in repeated tests, that while grouping of any kind appeared to secure greater production than individual work, small groups were superior to large in this respect, and subgroupings within the group were, as might have been expected, still more effective.

During the spring of 1919 an experiment was conducted by the writer in the public schools of Grafton, Mass., the object of which was to determine the civic and other effects of group work. Two seventh and eighth grade rooms and one sixth grade room were chosen for the field of operations. One of the seventh and eighth grade rooms (26 pupils) was placed on a co-operative basis. The pupils were allowed to freely assist each other and to work together. Their work was done in groups of from two members to the class as a whole, but averaging about six members. The groups were spontaneous both in formation and operation. Neither the individual pupil nor the individual group received any credit for work done. Report cards and individual grades were abandoned. Instead a class score was kept which the pupils strove to raise. This put a premium upon grouping being such as to include and improve the work of poor members of the class, for otherwise they would adversely affect the score. Class records for each subject were kept in the form of graphs showing median and quartile tendencies from day to day and from week to week. The pupils were encouraged by a rising line in any record and concerned over any drop. A general rising tendency of the three lines with an additional tendency to convergence of the three became a source of elation. This class was under the guidance of a teacher of years of experience and a reputation for knowing children and doing good work with them.

The other room of this grade (28 pupils) worked under the traditional form of government and discipline. Individual reward in the form of high marks and punishment in the form of low ones afforded the stimulus. The teacher of this room was also very capable but of a different type. The first room is referred to in the following tables as the co-operative or "C" group, while the second is referred to as the non-co-operative or "N."

The sixth grade room (38 pupils) was divided into two groups of roughly equal ability. This gave opportunity to check up such differences as might be due to teacher personality or other local influences, and also provided the experimenter with greater range so far as pupil age was concerned.

Between the two seventh and eighth grade rooms there was no possibility of rivalry entering into the work for they were unaware that they were being in any way compared. The "C" room simply realized that they were working under a new plan. An element of rivalry may have entered into the work of the sixth grade room as the two groups were aware of the difference in treatment, but it is improbable that it would be very keenly felt. All the rooms knew that they were likely to be tested frequently and the class scores determined. They were aware that they were expected to maintain the departmental standards of both quality and quantity, but they were unaware of any experimental study being made.

At the outset all three rooms were measured by the Monroe Arithmetical Reasoning and Silent Reading Tests. The seventh and eighth grades were also measured in English composition by the Hillegas Scale. The English composition was measured again every three weeks until the end of the ninth week. The reading and arithmetic were tested again at the end of fourteen weeks. Tables 1, 2 and 3 show the results.

TABLE 1. ARITHMETICAL REASONING. MONROE TESTS

		GRADE VI		GRADE VIII	
		C group	*N group*	*C group*	*N group*
Test 1	Upper quartile	21	29	23	24
	Median	18	21	17	19
	Lower quartile	11	11	9	14
Test 2	Upper quartile	24	32	30	32
	Median	21	25	25	25
	Lower quartile	12	13	12	15
Amounts gained	Upper quartile	3	3	7	8
	Median	3	4	8	6
	Lower quartile	1	2	3	1
Percents gained	Upper quartile	14	10	30	33
	Median	17	19	47	32
	Lower quartile	9	18	33	8

TABLE 2. SILENT READING. MONROE TESTS

			GRADE VI		GRADE VII		GRADE VIII	
Rate (speed)			*C*	*N*	*C*	*N*	*C*	*N*
	Test 1	Upper quar.	81	81	109	108	153	152
		Median	70	69	102	99	134	139
		Lower quar.	63	60	92	84	121	129
	Test 2	Upper quar.	127	121	119	114	160	161
		Median	116	102	105	101	149	149
		Lower quar.	102	91	93	85	136	133
	Am'ts gained	Upper quar.	46	40	10	6	7	9
		Median	46	33	3	2	15	10
		Lower quar.	39	31	1	1	15	4
	% gained	Upper quar.	57	49	9	6	5	6
		Median	66	48	3	2	11	7
		Lower quar.	62	52	1	1	12	3
Comprehension	Test 1	Upper quar.	14	20	22	22	28	31
		Median	10	16	18	18	24	27
		Lower quar.	6	12	13	11	19	21
	Test 2	Upper quar.	26	22	27	27	35	38
		Median	22	17	21	21	30	32
		Lower quar.	17	14	18	16	25	29
	Am'ts gained	Upper quar.	12	2	5	5	7	7
		Median	12	1	3	3	6	5
		Lower quar.	11	2	5	5	6	8
	% gained	Upper quar.	86	10	23	23	25	23
		Median	120	6	17	17	25	19
		Lower quar.	183	17	38	45	32	38

(In these reading tests the returns from grade six appear to be abnormally affected. They have therefore not been taken into account in the conclusions reached. All decimals in the foregoing have been figured to the nearest whole number.)

TABLE 3. ENGLISH COMPOSITION. HILLEGAS SCALE

GRADES VII-VIII	CO-OPERATIVE GROUP				NON-CO-OPERATIVE GROUP			
Test No.	1	2	3	4	1	2	3	4
Upper quartile	59	67	66	64	63	68	68	60
Median	53	53	52	56	51	52	56	54
Lower quartile	43	49	48	48	43	50	40	44
Loss or gain, Upper quar.				5				–3
Median				3				3
Lower quar.				5				1

It is at once apparent that there was no marked advantage, so far as subject achievement was concerned, for either group or method tested. On the whole the co-operative classes showed a slight advantage, although from test to test and from room to room it varies. There was a tendency in both types of work for the "fringes" of the classes to make greater gains than the middle range, with the tendency somewhat more marked in the case of the co-operative classes than in the case of the non-co-operative. That is, the distribution of test scores tended to become more discrete in the upper half of the class (or at least more extended) and to bunch upward in the lower half. This might bear the interpretation that group work is a stimulus to the leaders as well as to better work on the part of the relatively inferior.

Standards being as well maintained under the co-operative plan as under the usual one it was then given a certain amount of publicity and other teachers who desired to try it were allowed to do so. After three months of further continuation of the work in rooms where the measurements were made and of varying degrees of casual experimentation on the part of fourteen other teachers the teachers and pupils affected were asked for their candid opinion in regard to the co-operative organization of classes. Their replies, treated fully in the 1919 Annual Report of the Superintendent of Schools, Grafton, Mass., brought out as evident results: a readiness to bear responsibility, increased courtesy and consideration, encouragement of the timid and bashful, co-operative effort, more interest, and, in some cases, scholastic improvement.

The group work of the Grafton pupils was integrated by three factors. In the first place the work of any given group or constellation of groups constituted a common task. In the second place every member of every group felt his own personal responsibility for the result secured and any failure meant a perfectly apparent loss to the community. Third, the groups were spontaneously formed around momentary leaders. Integration depends upon leaders. Leaders may mean domination. But domination is less likely and a higher quality of leadership more probable where groups are small and frequently changed, or where they are spontaneous in their formation and capable of just as spontaneous dissolution when the task is completed.

One hundred twenty-nine of those to whom the Alpha Test was given were pupils who had had the advantage of from six months to a year or more of this co-operative work in Grafton. These pupils scored slightly lower in the number of intelligible reactions, but they scored both relatively and actually a little higher in the number of civic-social reactions. The accompanying table (4) and Fig. 2 show this quite clearly.

TABLE 4. GROUP ASSOCIATION TEST ALPHA

	Non-Group-Trained					Grafton Group-Trained				
Ages	No. of cases	Average No. intelligible reactions	Standard deviation	Average No. social reactions	Standard deviation	No. of cases	Average No. intelligible reactions	Standard deviation	Average No. social reactions	Standard deviation
10	7	21.1	2.5	0.7	0.2	6	19.6	2.2	2.0	0.9
11	19	22.3	4.0	1.9	1.4	17	24.2	4.0	2.4	1.5
12	7	25.6	5.4	2.2	1.0	14	24.2	4.9	2.5	0.9
13	19	30.0	6.7	2.7	1.6	21	28.5	4.8	2.3	1.4
14	32	32.7	6.1	3.8	1.9	24	32.1	5.1	4.2	1.9
15	32	36.0	3.2	3.5	2.2	17	35.2	4.1	4.0	2.0
16	38	36.3	3.0	4.2	2.4	9	35.7	3.1	4.0	1.9
17	28	38.4	1.9	3.3	2.2	11	37.3	3.5	5.3	1.9
18	36	36.8	4.2	2.6	2.1	10	37.3	2.8	5.4	1.0

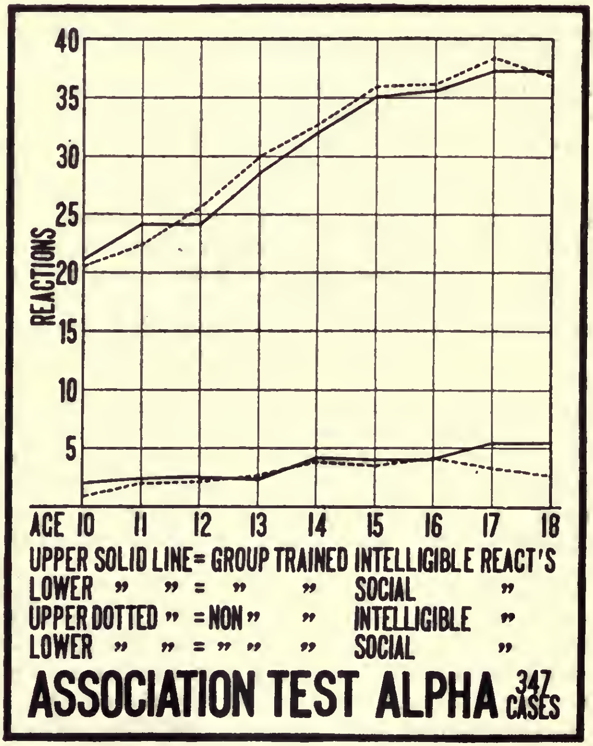

FIG. 2

To test more thoroughly the relationship between what we may call sociality and participation in group activity generally another group association test was constructed. This test, which we shall call Group Association Test Beta, consists of a list of twenty-one stimulus words and an opportunity to indicate the number and kinds of organizations to which the subjects tested belong or ever have belonged. The first eight words, which shall hereafter be designated as Series A, were taken from Test Alpha because they received the largest number and variety of reactions of the stimulus words in that test. These words, with characteristic social and non-social reactions follow:

Stimulus word	*Social reaction*	*Non-social reaction*
flag	defend it; my country; our country; loyalty; justice	the thrill it gives me; the first flag; the flag over our schoolhouse; a banner; Stars and Stripes; flagpole; American flag
law	obey; justice; duty	U. S. Constitution; no law, no government; rule; behavior; lawyers; courts; policemen
citizen	obedient to law; one who pledges loyalty to his country; people who work for others; faithful; loyal; one who looks out for the welfare of a town or city	American; citizen of the U. S.; rights; voting; naturalization
welfare	for the good of the town; taking interest in the country; welfare of the public	benefit; good; dental clinic; good luck; society that does good; for your own good
service	soldiers that went to France; O'Connor (local hero); every citizen should give his service to his country; Red Cross	don't be late delivering papers; church; servants; street cars; a favor; forest service
social	to be always pleasant; amiable; friendly; helping each other	a party; club; church; gathering; society
graft	disloyal profiteers; profiteers are traitors	member of political party; get away with money; prohibition laws being enforced; stealing; rich; getting something that isn't yours
community	collection of people helping each other; be a good member	locality; vicinity; lot of houses and stores; community house; group; school; people get together and sing

The provision was made in Test Alpha for space for explanation of reactions. A study of the explanations given, together with questioning where it seemed desirable, gave a number of valuable suggestions upon which to establish an interpretative viewpoint in both tests. A number of the reactions might at first appear social which were interpreted as non-social. Rigid exclusion was practised wherever there appeared to be the slightest occasion for doubt. A different policy might have been adopted and justified, but this one was chosen because of its relative simplicity and its greater definiteness. Only those reactions were taken as social which could be so interpreted from the probable viewpoint of a subject of the age of one reacting to a given paper. Criteria for judgment on this point were developed from general experience with children on the part of the examiner and on the basis of the explanations and interviews in connection with Test Alpha. By this means earnest attempts were made to avoid misreading adult interpretations into child reactions. Language is a social tool, and from the adult standpoint anything may be social.

Another difficulty arose out of the possibility that some of the acceptedly social reactions might be mere phrases that please, but this is probably offset by the numerous cases that were social, but, because of doubt in interpreting, were discarded as non-social.

The next thirteen words, intended to test the degree of group participation, with characteristic responses, follow:

Stimulus word	*Group-participation reactions*	*Non-Group-participation reactions*
rule	school regulation; a law to keep us out of trouble; baseball player put out of game; for everybody to obey	slide rule; make a straight line; keep to the right; military life
school order	obedience; silence; don't smoke	teacher; tells your character
score	playing baseball; we trimmed the Boys' Club five	2 to 1; 11 to 2; keeping score at games; basketball; a number
double play	two out at once; when I was put out in one	baseball; double score; when I saw the Braves play
sacrifice	sacrificing myself for team work; when we let ourselves be out to advance another	worship; to give up something you want; soldiers; to die for someone else; for welfare of others
run	going on an errand for my mother	to move fastly with the legs; chasing a street car; a score of one in baseball; exercise
gang; crowd; "the bunch"	the gang; the B R crowd I go with; our five	lot of boys; a bunch of fellows; the Greendale boys
initiate	ducked, ran gantlet, branded with ice; when Owen joined our club	joining a club; make fun

errand	for mother; hurry to the grocery before it closes; when I lost some money	running; go after; service
chums	Evelyn and I; my chums	particular friends; boys or girls who go together
member	our bunch	to belong; Sunday school class

In order that our measurement of group participation be more accurate each individual's returns from this list of thirteen were first interpreted in the light of his report as to the number and kinds of groups to which he belonged or ever had belonged. Membership in a family of brothers or sisters was interpreted as another group membership. This was a marked correlation (r = .56, p.e. .0204) between group membership as revealed by this report and group participation as indicated by the reactions. But neither group membership as indicated by the check list nor group participation as indicated by the returns to the stimulus words appeared to give a sufficiently accurate measurement of the thing we were trying to measure in relation to sociality. In the first place "membership" is such a loose and indefinite term with children and adolescents that it could not be accepted as an accurate indication of serious participation. In the second place the difficulty of interpreting returns was, even with the help of the check list of membership, therefore, as great if not greater than in the case of the social versus individualistic responses to the eight words of Series A. The final plan adopted was to accept those reactions only which were unmistakably such and average the returns thus secured with the number of groups to which the individual belonged. The returns finally secured by this process we have designated as Series B.

Regarding the whole test we should note that inaccuracies are inevitable, but by a constant exclusion of doubtful cases in our interpretation of each series we are reasonably certain of the reliability of our returns from a sufficiently large group, and we are reasonably clear as to what in each series is being compared. A non-social reaction to any word or list is not to be interpreted as indicating that any one reacting subject is non-social. An association test of this sort depends entirely upon chance verbal reactions and they cannot be a very accurate measure in themselves of any one individual's tendencies other than for the given moment. The absence, in a group test, of reaction time information, is a serious defect from this standpoint. On the other hand, it seems reasonable to accept such returns from a sufficiently large number of cases as an indication of tendency. The number of

GROUP ASSOCIATION TEST BETA

(Use pen and ink)

Full name..............................Age last birthday ....

Your grade in school.......How many brothers and sisters have you?....

Write opposite each word or phrase in the following list whatever it calls to your mind.

flag..
law...
citizen...
welfare...

service...
social..
graft...
community...

rule..
school order..
score...
double play...

sacrifice...
run...
gang..
crowd...

initiate..
errand..
chums...
member..
"the bunch"...

Put an X after each kind of organization in the list below, of which you have ever been a member.

baseball team..............
basketball team............
football team..............
track team.................
hockey team................
any other team.............
scout troop................
any other club or society....

charitable society........
church club or society....
military company..........
sporting club.............
secret society............
camping party.............
gang......................

musical club.....
canning club.....
sewing club......
social club......
committee........
class............
"circle"........

cases necessary to demonstrate this would depend, of course, upon the nature of the distribution of the returns, the degree of correlation indicated and the probability of error.

Test Beta was given to 517 pupils in the public schools of Grafton, Hopedale and Worcester, Mass., and Thompson, Conn. These pupils ranged in age from twelve to eighteen and over. The Pearson coefficient of correlation of sociality as determined by the reactions to Series A and age is barely significant but low, though somewhat higher than it appeared in Test Alpha. That between group participation (Series B) and age is higher. But the correlation between sociality and group participation is marked. These correlations are all shown in Fig. 3, as well as the correlation between sociality and group participation with the age factor eliminated by the

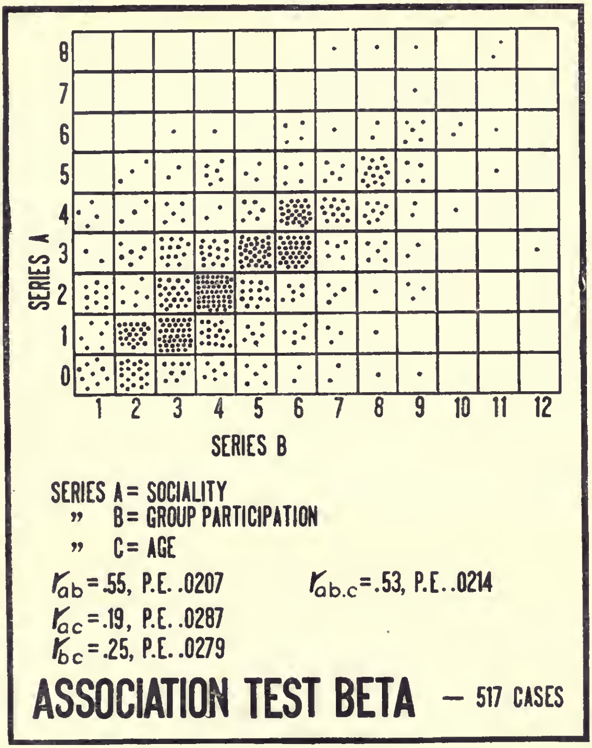

FIG. 3

method of partial correlation, and are offered as a part of the specific contribution resulting from the application and treatment of our tests.

The coefficient of correlation, however high, does not indicate which of the two factors is the controlling one. Sociality may be the result of group activity, but as most of this group activity was purely voluntary it might easily be asserted that it may be the result of the sociality of the pupils. However, in view of the observations and experience of men like Kerschensteiner and Scott and of the even slight degree of evidence resulting from the class group training in Grafton as shown in Fig. 2 and Table 4, it does not appear unreasonable to accept the group activites as causal, and to conclude that the group constitutes a stimulus, not only to greater productivity, but also to sociality.

III

Heretofore consideration of the social effects of group activity has been based upon purely empirical observations. These observations have been made in some detail by persons whose reliability and competence are beyond question, but like empirical data commonly they need to be reinforced by some kind of objective evidence. The group association tests Alpha and Beta have afforded us such reinforcement, but they themselves, in turn, have been demonstrated to have value as a means of measurement in matters of this kind. The tests as given and rigidly interpreted have revealed the existence of marked correlations. These correlations are not produced by the tests, but, rather, are uncovered or demonstrated by the tests and statistical treatment. If the tests reveal such correlations then it is evident that they have value. We may, therefore, state that we have found in the group association test, properly administered and carefully interpreted as described in the previous section, a reasonable means of measurement of the bearings of an educational factor.

As a test within a test, to measure the accuracy of our returns, a comparison was made of the age-sociality correlation coefficients for the two tests. Series A of Test Beta was taken from the list of stimulus words of Test Alpha. Therefore, if the tests have measuring value the correlation of sociality with age should not be radically different, though not necessarily exactly the same, for each test, even though they be given, as they were, to a different personnel. (Only

31 of the 347 Alpha subjects are included in the 517 Beta subjects.) The results were:

Alpha sociality-age (SA), r = .15, p.e. .035
Beta sociality-age (AC), r = .19, p.e. .029

As the other matters correlated were not identical in the two tests we could not demonstrate them in the same way, but taking into account the nature of correlation itself and the notable and definite coefficients we have secured we are prepared to propose that the application of the group association test and biometric methods to the measurement of the civic effects of group work and the consequent demonstration, not only of these effects but also of the value of the tests themselves, constitutes the specific contribution of this study.

Such tests might be applied to such problems as the relative social effects of groups of varying sizes and kinds, or the civic effects of different types of community life, or the comparative social effects of the group upon its superior and inferior members. Especially by the use of the method of partial correlation it would be possible to determine the degree of group influence in comparison with a larger number of factors than we have taken into account. This type of test may also be applied to the measurement of the influence of subject matter, teachers or administrative factors as affecting pupils in different ways, and may have value as part of a psychological examination and analysis of pupils. The chief advantages of association tests are the infinite variety of form they may assume to meet various conditions, the ease and quickness with which they can be made up for any material, and the readiness with which they may be given to young pupils. On the other hand their chief difficulties will always be (1) that of proper interpretation and hence of scoring, and (2) their inapplicability as group tests to any but very large groups. The problem of proper interpretation also creates an administrative difficulty, for one person must ordinarily be relied upon to do all the scoring unless some adequate control can be established.

IV

We have every reason to believe that normally one who is a member of a sufficient number of groups—who is a conscious participant in their activities—will develop a gradually increasing larger social consciousness, and the best there is in patriotism is to be found in just this type of social response. Dr. W. H. Burnham believes the training secured in the smaller groups to be the best sort of preparation for social functioning.

> "Whenever in the team sports the individual player sacrifices his own desires and his own interest for the success of the team, that is patriotism, and whenever the pupil in the school sacrifices his own interest for the sake of the school as a social group that is patriotism. The significant thing is that sacrifice of personal interest in the smaller groups, that is, training in patriotism in the smaller groups, is the best sort of preparation for the virtue of patriotism in the larger groups, the community and the state." (7.)

Dr. G. Stanley Hall goes even further and proposes that any attempt to develop the larger social consciousness too early may be disastrous. He says:

> "Group selfishness is the first step in overcoming individual isolation. . . . For most, humanity is too large a sphere of altruism to have more than a sentimental development, and today, when so many interests are taking on cosmic dimensions, may be liable to weaken demotic or yet narrower spheres now within the range of practical everyday duties." (14, II, 430.)

But we are compelled, at this point, to consider the danger of arrested development, not only because of a precocious enlargement of the individual's social field, but also because of lack of normal stimulation to enlargement and development into a socially adjusted individuality. Optimal stimulation will normally arise out of identification with a sufficiently large number of groups of different kinds. Dr. Hall further proposes that

> "Every youth should connect himself with as many other associations of diverse kinds as is practicable, for at this age, while individuality may be lost in one group only, it is saved and developed by several." (14, II, 430.)

Groups are not bound by nature to enlarge themselves into society as a whole. Nor do we usually consider society as a whole by any sort of analogy with any of the groups of which we are members. On the other hand the individual normally should integrate his various group connections into what is eventually society as a whole for him. This integration is effected by a process whereby he is himself a field of group interpenetration for his several groups. While one group can only very partially represent society and can serve only to that degree as an educative force, an ultimate integration of groups such as we here suggest will not only bear a greater likeness to the larger social whole but will also afford an increasingly adequate educational stimulus. Further, the gradual disintegration of any group, as all groups do disintegrate eventually, will not, under such a situation, deprive the individual of normal stimulation. His energy would be diverted into remaining social channels in response to remaining stimuli.

V

We have shown in the foregoing the importance of the factor of group training in civic education. Modern psychology affords a basis for such training in recent studies of conditioned reflex, mental tendency, *Einstellung* and the like, which, in turn, are very closely related. To the ordinary teacher, engaged in training citizens, the term conditioned reflex may convey little meaning. It is a product of the physiological laboratory of Pavlov, in Russia. Pavlov's experiments were performed upon dogs and the nature of their results may be, perhaps, best expressed in the following quotation from Burnham:

> "If I give a dog a piece of meat, immediately the salivary glands of the animal begin to function and to secrete saliva. This is an ordinary reflex act. Now, if every time I feed the dog meat I ring a bell, after a time I may ring the bell without giving the meat and yet the saliva reflex will occur and the saliva be secreted. In the latter case an association has been formed between the auditory stimulus of the ringing of the bell and the ordinary stimulus of the meat. Psychologically the difference between this reflex and the simple reflex is that, in the former, lower centers alone function; in the latter, the connection between the peripheral stimulation and the response of the gland is mediated by the brain cortex.
>
> "The ordinary reflex act Pavlov calls an unconditioned reflex. The odor or taste of meat is a biologically adequate, or, as Pavlov calls it, an unconditioned stimulus; the secretion of the saliva, the natural reaction. The salivary reflex on occasion of the ringing of the bell without meat he calls a conditioned reflex. This is due to the association of the indifferent stimulus of the bell with the biologically adequate stimulus of the food; and the ringing of the bell is called a conditioned stimulus." (5, 450.)

Since the experiments of Pavlov, Krasnagorski at Petrograd, Dr. Mateer at Clark (25), Watson at Johns Hopkins and others have made extensive experiments with children and have secured results similar to those of Pavlov. Many forms of response are possible and variations in procedure and in result of many kinds have been tried and secured. For instance, even with a dog, Pavlov found the stimulus can be made to produce a reaction at a certain time later, say two or three minutes or more, so that a memory element is involved.

The conditioned reflex is a factor in everyday life, ubiquitously and constantly observable. Some of these responses date from the very earliest years, during which Watson believes personality is formed. We are offered a very interesting account by Harvey O'Higgins (29, 153) of a man who was morbidly critical of everything connected with his meals, and who was especially irritable towards his mother as a result of the unpleasant conditioning of his first taking of food. His mother had been unable to get him to nurse normally and had been compelled to feed him with a spoon. This was accompanied by fits of colic, screaming, etc., and his mother and feeding both became inseparably associated with discomfort. Similarly we have examples of children who have experienced excessive expressions of love from their parents, leading to a craving for indulgence and adulation, and perhaps to Narcissism. Such cases make the parents and, perhaps, even later marriage partners, slaves.

The school affords countless opportunities for the formation of both good and bad conditioned reflexes. Witness the twisted postures adopted in the course of premature first efforts to write in the lowest grades, or the lad who can only recite either with his hand on his desk or when he is on his feet, or the more facile use of good English within the restricted limits of the English class, or the aid of a bit of forbidden chewing gum to concentration of attention.

The conditioned reflex, however, is not always positive in its action. Its negative or inhibitory action is just as common, and not improbably more serious. Meumann reports a case where a hostile teacher tactlessly introduced a boy to his new teacher in such a way as to make his success in the new room impossible for him. Not until he changed his school was it possible for him to do his usual good work. (6, 484.)

The amazing success of some "new" methods may be partly due to the removal of inhibitions that have grown up around the old ones. New methods are notoriously more successful when first initiated. If this success is largely due to a removal of inhibitions it would compel us to give attention to the consideration of whether or not inhibitory conditioned reflexes have, because of a greater amount of emotional accompaniment, a greater influence upon the school life of the child than many of the positive ones.

Applying the conditioned reflex to our civic training the first thing that occurs to us is the necessity for making effective in school those associations which we wish to be effective outside of and after school. The school should establish situations as nearly those of normal society as possible and afford training and experience in reacting to those situations. They will then become the conditioned stimuli for the kind of civic response outside of school which has been given in school. The older members of large families, as a result of training, are notoriously more ready, throughout their lives, to assume responsibilities. The leaders in our urban life, for years, have been not only frequently from large families but surprisingly often the products of rural communities where they had early training in assuming responsibilities on the farm. Less comforting is the reflection that so many of our younger politicians have had training as urban gangsters, and there received a training that has been denied the generality by the schools.

If the school fail to give such training and experience, and especially if it fail to give a normal opportunity for putting into effect normal social responses its very subject matter may well become a conditioned stimulus to a non-social reaction. Such a non-social reaction may shortly become inhibitory of ordinary social responses, and the individual may develop a degree of uncertainty in regard to the purposes, propriety or desirability of different kinds of reaction—an uncertainty that he may delude himself and others into believing due to rationalization, especially if he has had an excellent "book course" in civics and the like. But his real difficulty will be a lack of the proper conditioning stimuli because needed associations have not been established. (4.) The man in this situation would be described as hesitant. Hesitancy and uncertainty are closely allied to fear, and fear of the wisdom or propriety of a few social responses is all that is needed to provide an ample number of conditioned stimuli to maintain a more or less continuous response in the form of a socially unfortunate "set" which will interfere with the social efficiency or activity of the individual. We have illustrations of this in the following cases:

Case 1. Sickly boy; too weak to be subjected to school conditions. Tutored by his sister. Grew up into a timid, shrinking boy. Father finally alarmed and managed to get him to join a Boy Scout patrol. Group activity and actual accomplishment made him over until he became the patrol leader.

Case 2. Family of Scandinavians had just immigrated to America. Two boys were sent to school. Understood no English. Schoolmates teased them at recess till they took to hiding throughout each recess period. A boys' club leader managed to get them into a Scout patrol where a different spirit prevailed. They learned how to co-operate and took their places in camping parties, basketball teams, etc. Became socially efficient, and were later instrumental in getting their parents into night school and on the way toward naturalization.

Case 3. Young lady, member of socially meagre household and the product of an environment with insufficient social stimulus. Fortunate enough to make the winning design for the medal for a public exposition.

First elation turned to later fright at publicity and being thrown into sharp contact with the community as a whole.

Case 4. Young lady of about 20. Owing to her mother's aversion to social life she has been deprived of social experience. Home life refined. An invitation to dinner threw her into a state of pitiable fear. Circumstances rendered acceptance unavoidable. At dinner was so frightened and uncomfortable that she would not, for instance, take cream for her coffee for fear she might spill it. Same young lady would not enter famous metropolitan stores on the occasion of a recent trip for fear she might commit some *faux pas*. List of her imagined possibilities for embarrassment amazing in range as well as in improbability of content.

Case 5. Boy of 12. Restless. Could not restrain tendency to talk and move about in school. Teachers punished instead of studying him. Developed hatred for school. Frequent truant. Further punishment. Regarded by community as a bad case and "different." Ran away and hid in an unused cemetery vault. Lived for several days on results of nightly foraging trips. Discovered and brought back. Superintendent of schools transferred him to socialized schoolroom where group work prevailed. Almost immediately he showed ability, willingly assumed and discharged responsibility. One year later entered high school and had ambition to later go to engineering school.

Instances like these could be multiplied but these will suffice.

Baird (2) and others have shown that a mental set may be established by purely subjective factors. These factors are stimuli just as certainly as objective and external factors, and any stimulus may become a conditioned stimulus. Thus fear and uncertainty arising out of a lack of proper stimuli, such as we have just seen in these cases, may in turn, themselves become improper stimuli. School rules may inhibit impulses to social activity and thus create a whole series of conditioned responses such as the association of an unpleasant affective condition with school and a consequent lowering of school effectiveness, or the association of passivity rather than of activity with learning. These are antagonistic to sociality as well as deleterious influences upon the learning process. In one classroom we may have low productivity, relative isolation and non-application or unsocial application associated. In another we may have higher productivity under social conditions, group activity and production and social responses associated. It is quite possible, under the latter conditions, to establish a civic or social set whereby the individual could be trained to group response in the interest of increased productivity, which is always a pleasurable thing, and thereby work toward an elimination of the hesitancy, uncertainty, etc., that characterize so many people.

It is not what one knows that will make him a good citizen. It is what he will do with that knowledge that will make him either a good or a bad citizen. A civic training such as the foregoing suggests would interfere with individuality to the least possible degree, would place no obstacles in the way of natural superiority, and, on the other hand, it would provide opportunity for the relatively inferior to demonstrate some degree of personal excellence, to share in the success of his group and to effect a very desirable compensation. For all it would provide opportunity for activity, spontaneous association and the development of desirable attitudes. Of course, in practical application it would be necessary to take account of development and mental levels, etc.

VI

In the foregoing pages we have developed the following points:

1. Training is a more reliable basis for civic education than instruction, and training in the form of varying degrees of pupil self-government and group work has been developed in progressive schools with good results.
2. Group work has for some time been recognized as a stimulus to individual activity. The experiments at Grafton and the results of the two group association tests, Alpha and Beta, indicate that it is also a stimulus to an attitude of social response.
3. The use of these tests has thus produced a specific contribution in the form of objective evidence regarding the social value of group work. It has also shown, as a further contribution, that civic or other factors may be measured in their effects or inter-relationships by such group association tests if care is exercised to secure a large enough number of cases and to interpret data properly. The value of these tests, especially when their results are treated by biometric methods, has been demonstrated by the results we have secured.
4. Group work, to be most effective, should be so organized that the individual may be a member of many groups in order to provide the individual with the proper stimulus to enlargement of social horizon without encouraging social precocity.
5. Psychological studies of the conditioned reflex, mental set, and related phenomena indicate that pupils should be trained in social response in order to establish proper effective reflexes and to avoid anti-social inhibitions.

BIBLIOGRAPHY

1. Adler, Alfred. "The Neurotic Constitution." New York. Moffat, Yard & Co., 1916. 456 p.
2. Baird, John W. "The Rôle of Intent in Mental Functioning," *Philosophical Essays in Honor of James Edwin Creighton.* New York. Macmillan, 1917. p. 307-17.
3. Burnham, W. H. "Hygiene of Home Study." PED. SEM., 12, June, 1905, p. 213-30.
4. Burnham, W. H. "Orderly Association as a Condition of Efficient Brain Activity," PED. SEM. 20, 360-390, 1913.
5. Burnham, W. H. "Mental Hygiene and the Conditioned Reflex," PED. SEM., 24, 4, 449-88, December, 1917.
6. Burnham, W. H. "The Significance of the Conditioned Reflex in Mental Hygiene," *Mental Hygiene*, V, 4, 673-706, October, 1921.
7. Burnham, W. H. "The Newer Aims of Physical Education, and its Psychophysical Significance," *Am. Phys. Ed. Rev.*, January, 1922.
8. Brown, William. "The Essentials of Mental Measurement." Cambridge, University Press, 1911, 154 p.
9. Cobb, Stanwood. "A New Movement in Education," *Atlantic Monthly*, 127, 2, 227-34, February, 1921.
10. Cooley, C. H. "The Social Process." New York, Scribner, 1920, 430 p.
11. Dewey, John. "The School and Society." Chicago, University of Chicago Press, 1907, 129 p.
12. Dontchef-Dezeuze, M. "L'image et les reflexes conditionnels dans les travaux de Pavlov." Paris, Alcan, 1914, 176 p.
13. Goett, Th. "Assoziationsversuche an Kindern," I Teil, *Zeitschr. für Kinderheilkunde*, Band I, 1910-1, 241-314.
14. Hall, G. Stanley. "Adolescence." New York, Appleton, 1904, 2 vols.
15. Holt, E. B. "The Freudian Wish." New York, Holt, 1915, 212 p.
16. Humphrey, George. "The Child's Unconscious Mind," *Jour. Abn. Psych.*, 1921, 15, 400.
17. Humphrey, George. "Imitation and the Conditioned Reflex," PED. SEM., 28, 1, 1-21, March, 1921.
18. Jenks, Jeremiah. "Citizenship and the Schools." New York, Holt, 1909, 264 p.
19. Jung, C. G. "Studies in Word Associations." London, Heinemann, 1918, 575 p.
20. Kerschensteiner, G. "Staatsburgerliche Erziehung der deutschen Jugend," 3 auf. Erfurt, Villaret, 1906, 78 p.
21. Kerschensteiner, G. "The Idea of the Industrial School," tr. by Rudolph Pintner. New York, Macmillan, 1913, 110 p.
22. Kerschensteiner, G. "The Schools and the Nation," tr. by C. K. Ogden. London, Macmillan, 1914, 351 p.
23. King, Irving. "Social Aspects of Education." New York, Macmillan, 1917, 425 p.
24. Kendall and Myrick. "How to Teach the Fundamental Subjects." New York, Houghton Mifflin, 1915, 329 p.
25. Mateer, Florence. "Child Behavior." Boston, Badger, 1917.
26. Mayer, A. "Ueber einzel- und Gesamtleistung des Schulkindes," *Sammlung von Abhandlung zur Psychologischen Pädagogik*, I Band, IV Heft. Leipzig, 1904.
27. Meumann, E. "The Psychology of Learning," tr. by J. W. Baird. New York, Appleton, 1913, 393 p.
28. Moede, Walther. "Experimentelle Massenpsychologie." Leipzig, Hirzel, 1920, 239 p.

29. O'Higgins, Harvey. "The Secret Springs." New York, Harper, 1920, 243 p.
30. Rusk, R. R. "Experiments in Mental Association in Children," *Brit. Journ. Psych.*, 3, 349-85.
31. Scott, Colin A. "Social Education." New York, Ginn & Co., 1908, 300 p.
32. Sutherland, A. H. "Critique of Word-Association Reactions." Menasha, Collegiate Press, 1913, 46 p.
33. Strayer, George D. "A Brief Course in the Teaching Process." New York, Macmillan, 1912, 315 p.
34. Triplett, Norman. "The Dynamogenetic Factors in Pace Making and Competition." *Am. Jour. Psych.*, July, 1898, 9, 507-33.
35. Watson, J. B. "The Place of the Conditioned Reflex in Psychology," *Psych. Rev.*, 1916, 23, 89-116.
36. *Second Annual Bulletin*, 1918-19, Moraine Park School, Dayton, Ohio.
37. *Third Annual Bulletin*, 1919-20, Moraine Park School, Dayton, Ohio.
38. "The Social Motive in School Work," *Francis W. Parker School Yearbook*, June, 1913, Vol. 1, 139 p.
39. "Education through Concrete Experience," *Francis W. Parker School Yearbook*, June, 1915, Vol. 4, 188 p.

THE PRE-SCHOOL HYGIENE OF HANDICAPPED CHILDREN*

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A considerable proportion of the handicaps of school children are inherited and a very large fraction of those not inherited are acquired in infancy. This means that hygiene of handicapped children must have due regard to the pre-school years. The importance of these years has not received full recognition. Here, as elsewhere, the pre-school period is relatively neglected, often by parents, more often by the state; and provisions for handicapped children of pre-school age have only, to a limited extent, become part of public policy.

The significance of the pre-school years will be briefly indicated for each of the eight major classes of handicap found among school children. No attempt will be made to cover the medical technicalities of this broad subject; but some suggestions of a practical nature will be ventured. Although we lack the funds and the administrative equipment to do full justice to the handicapped child of pre-school age, much can be done even with present facilities to improve his status and his outlook. It is important that baby welfare agencies, public health nurses and social workers should do more to direct parents in the proper care and training of handicapped infants. It is important that public school provisions should gradually penetrate downward into the nursery period of these children who are peculiarly in need of special educational treatment.

I. Blindness

From a statistical point of view the problem of blindness in the pre-school period is not so great as it is in later years. Indeed blindness is peculiarly incident to adult and old age. Only 1% of all the present blind are under five years of age; but from the standpoint of educational hygiene which must always regard the individual rather than the mass, this small group of blind, young children is extremely important. Moreover, from the standpoint of causation, the pre-school period is very significant. One-third of all cases of blindness occur before the age of 21; and over one-half of the cases occurring before that age come before the fifth year, and over one-third before the first year of life.

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*This discussion is part of a broader treatment of the subject to be published in a volume on "The Pre-School Child: From the Standpoint of Public Hygiene and Education." (Houghton Mifflin Co., Boston.)

About four-fifths of blindness is ascribable to diseases, and in about one-tenth of all the cases there is an hereditary factor at the basis of the disease or the blindness. Best has studied the distribution of the blind by the most important causes, according to the age of the loss of sight, and found in substance the following results: In congenital blindness the leading causes are malformations, ophthalmia neonatorum, atrophy of optic nerve and hydrophthalmus. During the first year of life by far the most important cause is ophthalmia neonatorum. Other causes reported are sore eyes, hydrocephalus and brain fever, cataract and corneal ulcer. From the first to the fourth year, external injuries are in the lead, with meningitis, measles, scarlet fever, "sore eyes," small pox, cataract and atrophy of the optic nerve as minor causes. External injuries include accidents and other injuries from burns, firearms, sharp instruments, like scissors and knives, explosives, flying objects and falls. About 20% of the cases of blindness occurring in the pre-school years from one to six are apparently due to such injuries. A greater amount of prudence on the part of parents would undoubtedly reduce the amount of blindness from this source. The safety first campaign has further conquests to make in this field.

Ophthalmia neonatorum, an inflammatory disease caused by the gonococcus germ, is yielding somewhat to preventive endeavor. Forty states now have laws making it obligatory to report inflammation of the eyes in the new born. Many states supply a prophylactic solution free by statute or by health regulation. In some states there are special protective measures relating to the practice of midwives. With proper enforcement these laws unquestionably bring results. The disease has shown some decline; but by no means enough to justify any relaxation of effort on the part of health officers, nurses and physicians.

In addition to the general compulsory education laws, there are special applications of the laws to the blind in over one half of the states of the union. These laws, however, do not give recognition to the very great importance of the pre-school period; indeed in many cases they specify the educational period to be so many years after the age of seven or eight, etc. Nevertheless, the pre-school years are in many respects the most important in the education of the blind child. It is so easy to make the child in this period the victim of unintelligent compassion or of positive neglect, and to plant into his growing character traits which it will be difficult for later re-education to eradicate. Much of the unnecessary dependency of the blind, many of their psychological peculiarities, and their mannerisms (the so-called "blindisms") are the outgrowth of faulty training in the pre-school years.

Dr. Saemisch has therefore made the following general rule for parents in the management of their blind babies: "Treat the blind child exactly as if it were a seeing child." This is a safe rule, with a few reservations which common sense will supply. The important thing in the rearing of a blind child is the protection of his personality. This must be made strong, self-reliant, happy. He should therefore learn to walk at a normal age, even though he gets bumps; he should romp, and explore and play with toys; he should be as active in body and as investigative in mind as a seeing child. He should learn to dress and undress, comb his hair, take care of his person and possessions; keep himself clean; and acquire agreeable habits of deportment. He should not be made conscious of his handicap; but rather of his obligation to take a normal place, with normal responsibilities, in the family life. These are the primary lessons in the formation of his character, and they can be learned in a good home.

If the home is such that these lessons cannot be learned, the child should be boarded out in a competent home, or attend some nursery or kindergarten, or he should be placed in the nursery department of some institution for the blind. A considerate, responsible, domestic home, however, is, for educational reasons, to be preferred to a merely custodial asylum.

The needs of the pre-school blind child are so vital that there is room here for the development of a new kind of home teaching service. This service as now conducted by state and private agencies is mainly confined to those of adult life; but it should be directed also to the parents of the blind babies and to the infants themselves. Lacking such service it is incumbent on nurses, social workers and visiting teachers to impart and to apply these important elementary principles in the mental hygiene of the visually handicapped.

II. Deafness

Deafness is in a double sense a problem of the pre-school period. Unlike blindness, the vast majority of the deaf acquire their handicap at birth or during infancy. Figures presented by Best give the following percentages for the different ages: at birth, 35.5%; from birth to 2 years, 16.9%; from 2 to 4 years, 17.1%; from 4 to 6 years, 7.3%; making a total of 76.7% for the pre-school period; and only 23.3% for the whole span of school and adult life. In other words, three out of every four of all deaf individuals are so handicapped before their sixth birthday.

Of the 35.5% of cases which occur at birth a large proportion are strictly hereditary, and probably in the majority of these instances some parental or ancestral deafness will be found. The reduction of these hereditary cases will depend upon the gradual adoption of eugenic safeguards.

Nearly all the remaining cases arise in infancy or early childhood and are due to infections of the middle ear or of the internal ear. The chief causal diseases are scarlet fever and meningitis. Other diseases which together swell the total are brain fever, typhoid, measles, catarrh, diphtheria, whooping cough and influenza. The reduction of this group of cases is plainly dependent upon the growth of medical prophylaxis; and the control of complications in those diseases where prevention fails. The major enemies that close the Ear Gate of the City of Man Soul are bacilli.

As in almost all physical handicaps the most important consequences are of a psychological character, and have to do with the mental welfare of a personality. The most serious of all these consequences are those which concern the production and interpretation of speech; and these are important because they have such a direct influence upon the social life of the deaf. It follows then that with the deaf, as with the blind, we should so far as possible treat the child as though he were normal, make him active in mind and body, and give him full opportunities for companionship and responsibilities. The importance of preserving the health of personality is the strongest argument in favor of the use of the oral method (as opposed to the manual sign method) in the training of deaf children. By means of this method even the congenitally deaf child can acquire some degree of speech; and the semi-mute child who has acquired his deafness after he learned to talk is enabled to retain and to perfect his speech. The same method assists both the deaf mute and the semi-mute to read through sight the speech of others. The psychological importance of developing these speech abilities along natural lines need not be argued.

The most favorable time for giving instruction by the oral method is in infancy and early childhood; before the customary age when deaf children are sent to institutions. The ideal arrangement for such instruction would be in kindergarten or nursery establishments; and our day classes for the deaf, which are increasing rapidly in our public schools, should make every effort to secure their pupils before the legal compulsory school age. The public schools are apparently in a better position to reach down into the homes and into the infancy period than are state institutions; so the former as well as the latter could develop a type of home teaching which would be of incalculable service to parents and children. Even illiterate parents have sometimes used the oral method with success; and it has been said that the most skillful lip readers have been recruited from those homes where mothers have persistently and consistently used this method from the time the baby suckled in their arms.

The pre-school period is pre-eminently the period of language development for normal children, and for this very reason it must also be the most promising period for the oral education of the deaf. Teachers, social workers and nurses may guide parents to better utilize these precious years in behalf of the deaf and semi-deaf. They are also sometimes needed to reveal the presence of deafness where it is not suspected. As Cornell says, "No one has ever recorded that a small child of his own initiative complained of inability to hear."

III. Crippled Children

We consider a child crippled when he is handicapped because he lacks the normal use of skeleton or skeletal muscles. This handicap, like deafness, occurs more frequently among children than adults. One-fourth of the whole crippled population, as shown by the Cleveland Survey, are under 15 years of age, and in over one-third of all the cases the disability originated before the age of 5 years. About one-half of the disabilities due to defect of foot or leg occur before the age of 6. It is evident that the problems of prevention and treatment involve to a considerable degree the pre-school period.

A careful analysis of the statistics of causes among the children of Cleveland shows that infantile paralysis is by far the most important factor, accounting for 41% of all the cases. Tuberculosis of bones and joints comes second, accounting for 15%. These two diseases are, therefore, responsible for well over one-half of all cases among children. Fortunately both diseases yield in some measure to preventive control; and skillful medical and surgical care can ameliorate their consequences.

The primary importance of timely medical attention must always be emphasized. Parents and social workers, however, often make the serious error of placing exclusive stress on the medical and surgical aspects. The error is serious, because it means the neglect of mental and educational hygiene. Although everything should be done to reduce or remove the handicap in a physical sense, our ultimate objective ought to be the training of the child so that he will be a healthy individual in the psychological sense. For if his personality is not distorted or crippled he may still be a useful and happy member of society. The elementary lessons in character formation begin in the nursery period. It is easy to spoil a child in this period; and if he needs, as so often is the case, a somewhat prolonged treatment in an institution, it becomes doubly important that he should not be spoilt, but should acquire habits of self-help, attitudes of self-reliance and a spirit of conquest toward his physical defect. Fortunately, at least three out of four of all crippled persons over 15 years of age are probably capable of profitable employment alongside normal persons.

The war has made it clearer than it has been before that the final handicapping effect of disability depends often upon the morale of the individual. Indeed, physical failure if not too extreme may actually be the stimulus to a development of intellectual and spiritual power. Adler states this theory of mental compensation through the intervention of the nervous system in these general terms: "The realization of somatic inferiority by the individual becomes for him a permanent impelling force for the development of his psyche." If reeducation can build up the morale of a soldier so that he can successfully or even triumphantly carry his disability, it follows that judicious education in the morale of physically defective children will have a preventive, hygienic value. Morale has been described as a kind of mental preparedness. This policy of preparedness should include the pre-school years, which are often of critical importance.

IV. Physically Defective Children

This term has been used for convenience in a previous chapter, to include all children so seriously handicapped by malnutrition, cardiac defect or chronic disease as to be urgently in need of special hygienic or educational arrangements in school. The term loses even this precision when applied to children of pre-school age. It is, however, profitable to ask to what extent is the physical defectiveness of school children traceable to the pre-school period? This simple question has not been adequately reckoned with. Indeed the future developments in the fields of Medical Inspection of School

Hygiene, and of Social Pediatrics, cannot be intelligently directed without a frank acknowledgment of the fact that a large proportion of the physical defectiveness of children originates in the pre-school stage of childhood.

Malnutrition has recently come to the foreground as a handicap of basic importance; and at present it is being attacked through nutrition classes and educational measures. This is a splendid work; and yet the fact remains that a very large percentage of these numerous undernourished pupils were undernourished before they entered school. And furthermore an equally large number of candidates for the nutrition classes three or four years hence are undernourished toddlers now. The logic of the situation needs very little elaboration. The most important field for the extension of nutrition hygiene is "the gap" between the milk station period and the first grade. The following statement was applied to Scotland, but it is still true enough of other countries to merit quotation here: "The baby, if he lives, receives a certain amount of daily care in feeding, washing and clothing, and the school children are made ready for school; but the toddlers from two to five are nobody's care."

Dr. W. R. P. Emerson has listed the following factors as jointly responsible for the clinical picture of malnutrition as found among school children: 1. Diet; 2. Health habits; 3. Rest and fatigue; 4. Home control; 5. Special physical defects. It is clear that none of these factors is peculiar to the school period. There are, of course, certain cases which are caused or exacerbated by vicious school conditions; but these are probably more than offset by cases in children of pre-school age, which have not enjoyed the normalizing influence of school life. We should, therefore, be attacking the problem of malnutrition more nearly at its source by reaching the children in their pre-school years. It would not require very revolutionary changes in the present technique of infant welfare and public school work to accomplish the results. Pre-school clinics and children's health centers are pointing the way.

Another phase of the great problem of malnutrition is rickets. This common disorder concerns the pre-school period peculiarly. Frequently it dates back to the foetal stage of development, and it is most characteristic of the ages from 6 months to 18 months. Although there is still some obscurity regarding its true origin, recent studies have shown that it is clearly a disturbance of nutrition; and one which will yield to control in a large scale through systematic measures, including cod liver oil and heliotherapy. Such preventive control will not only reduce the handicap of rickets, but the rachitic complications which increase mortality and later morbidity.

Still another aspect of the same great problem of nutrition is represented in dental caries, by far the most common defect in American children. One of our best authorities who has worked on a large scale with school children and who in the beginning placed great stress upon the importance of cleanliness of the teeth, has come to the significant conclusion that the most important factor in the causation of caries is dietary, and that "correct feeding of a child from birth to 12 years of age would in itself partially, if not wholly, eliminate dental decay."

The development of the teeth indeed presents a pretty example of the importance of the pre-school period—and of the temptation to ignore that importance. The cusp or biting surface of the sixth year molars are formed before the child is even born, and the enamel organ for the wisdom teeth is formed as early as the third year of life. It is quite in harmony therefore, with the facts of embryology to suppose that the nutrition of mother, infant and child is a decisive factor in determining the vitality of the teeth. Probably the most foresighted and the most thrifty method of dental hygiene is the improvement of the nutrition of children with milk teeth.

A manual in pediatrics would be required to review all of the chronic and acute diseases which handicap early childhood. Statistical tables analyzing the causes of mortality, and less complete statistical data showing the age incidence and frequency of diseases, reveal with quantitative emphasis the significance of the pre-school years for bodily health. Medical inspection and health supervision of school children are only completely justified when based upon an adequate preventive program of health supervision of the pre-school period.

V. Mental Abnormality

In its broadest sense the term psychopathic includes all forms of mental abnormality, not only the definite mental diseases (the psychoses) which come to the attention of the court and the physician; but the less pronounced disturbances which express themselves in various forms of "nervous" invalidism and mental inefficiency.

On first impression no problem would seem to be more remote from the scope of pre-school hygiene than that of "insanity." Senile dementia seldom occurs before the age of 60; involution melancholia seldom before 40; over half of the cases of general paralysis are seen between the ages of 35 and

50; of all the cases of dementia praecox and manic-depressive psychosis, more than half develop before the age of 30 (Rosanoff). From statistics it appears (in New York) that only one psychotic child under 15 is admitted for hospital treatment per 200,000 of population. Furthermore, a considerable proportion of the various insanities are caused by such factors as hereditary predisposition or transmission, alcoholism, syphilis, drug addiction, and head injuries.

A closer analysis of the situation will, however, reveal that there is an important group of mental disorders, the psychoneuroses (the hysterias, neurasthenia, psychasthenia) and certain forms of dementia praecox, in which environmental and educational factors play an important rôle. In many of these instances, the origin of the conditions may be chiefly psychogenetic, and the date of genesis may go back to very early childhood. This must also be true of innumerable borderline conditions, in which the individual does not manifest a frank psychosis, but is maladjusted, and inadequate in his social behavior. It is disorders and deviations of this character which are most subject to control, and will respond to preventive and ameliorative treatment. It is in this domain of mental hygiene that the pre-school period again asserts its fundamental importance.

It is unnecessary to accept uncritically the doctrines and interpretations of psycho-analysis; but we are compelled to recognize the justice of an emphasis upon infancy in any dynamic or behavioristic type of psychology. We must at least subscribe to such a conservative statement as the following one from the well-known British psychiatrist, Dr. Richard Rows. The statement occurs in an address on "The Biological Significance of Mental Illness" made at the recent celebration of the one hundredth anniversary of the establishment of the Bloomingdale (New York) hospital.

"Of special importance also are the experiences of childhood. An unhappy home or unjust treatment as a child may warp the development of the personality, lead to a lack of self-confidence, to the predominance of one emotional tendency, and so prevent that balanced equilibrium which will allow a rapid and suitable emotional reaction such as we may consider normal. This may lead to a failure of development or a loss of the sense of value, because the existence of one dominating emotional tendency so often produces a prejudiced view which may render a just appreciation of our general experience almost impossible and may seriously disturb our mental activity" (p. 110). Rows, himself, illustrates the truth of this by describing the case of a mentally ill woman in whom "the germ of her serious breakdown thirty years later was laid in her fifth and sixth years."

In somewhat the same strain, Freud has said, "The little human being is frequently a finished product in his fourth or fifth year and only reveals gradually in later years what has long been ready within him."

To give the broad psychological principles above suggested immediate practical application would be a prodigious task, because it would involve the re-education of countless parents who are unconsciously moulding the character of their children in the pre-school years. But if the principles are true they must at least guide us. They will serve to place in a new light the responsibility and power of the home; the great value of all social work which improves family welfare, and the importance of recognizing psychoneurotic symptoms in their earliest stage. Such symptoms are often overlooked and "dismissed as signs of badness or naughtiness." According to Freud, neuroses in children are far from rare and most frequently take the form of anxiety hysteria. Whether the symptoms come to clear clinical expression or not, there is only one safe rule. We must have a respect for both chronic and episodic abnormalities of conduct even in young children, and should shape our nurseries and kindergartens so that they may serve a more premeditated function in the field of mental hygiene.

VI. Delinquency

The general observations made with reference to psychopathic conditions apply to the problem of delinquency. The whole subject is so complicated that very few generalizations may be ventured. Frequently crime has an entirely adult setting and background; but it is coming to be recognized that many adult delinquents were juvenile delinquents and that the most promising field of prevention is that of juvenile delinquency. Here again the causation factors often appear to be peculiar to adolescence; but frequently also the genesis of the delinquent career can be readily traced to the period of childhood, preceding adolescence. The history of the case reveals prodromal symptoms at the age of eight and nine; and we are justified in saying that the potential delinquent boy of that age is a particularly promising subject for reform or guidance.

Now, whether the delinquent traits in many of these cases could be traced still further back to the pre-school period is a fair problem for consideration. The concept of delinquency when applied to very young children may only confuse us and obscure the true facts; but the concept of character formation is one which cannot be pushed too far back. Character in the psychological sense, and even in the ethical sense, has roots which go down to the cradle. The elementary lessons of obedience, inhibition, poise, self-control, are normally learned in the nursery period, just as elementary speech is then acquired. The child does not learn all he is ever going to say in that period; but the instrumentality and to no small extent the very manner of his subsequent speech are then established. So in the field of conduct. Social attitudes, personal prejudices and predilections, and the balancing of emotional tendencies are in broad outline determined before school entrance. Later delinquencies may be but symptoms of irritabilities and inharmonies which date back to an abnormal home life.

This is all vague enough, and common sense must save us from errors of emphasis; but kindergartner, nursery matron and parent should have due regard for persistent behavior anomalies and conduct disorders of the pre-school child. Such symptoms may have a prognostic import.

VII. Speech Defects

Speech defect is unquestionably a problem which concerns the hygiene of the pre-school period. This period is preeminently one for the acquisition of oral speech, the most distinctive and in many ways the most complex of human accomplishments. From the first birth cry to the busy questioning and sound plays of his kindergarten years, the normal child is steadily engaged in the task of acquiring the elementary technique of speech and of language. Instinct aids him; evolution has imparted to his nervous system both the propensity and the capacity to talk; but to no small extent speech is an art which has to be learned anew by each individual. It is not purely automatic, and full perfection comes to but few.

Mild imperfections of speech and deficient voice control are extremely common; and over 2% of all school children are reported as being speech defective. Sometimes these defects have been attributed to faulty school hygiene and to unwise methods of teaching spelling and reading. There is no doubt that our public schools have very much neglected standards of oral expression; but there is good evidence that the overwhelming proportion of speech defects originate in the preschool period. Wallin, who made an extensive census of speech defects in St. Louis school children, found that 81.4% of all the cases of stuttering began before the age of 6; only 15% between the ages of 6 and 10; and 3.4% after 10. The figures for lisping emphasized even more strongly the significance of the pre-school period. The term lisping was used in its technical sense to include all forms of faulty articulation, inabilities and difficulties of pronunciation, slurring and sound substitution. It was found that 96% of the "lispers" began to lisp before the age of 6; 3.2% between the age of 6 and 10; and .8% after the age of 10.

Combining these figures we are compelled to recognize that at least 15 out of every 20 cases of speech defect originate in the pre-school period. These defects are not, of course, equally important. Stuttering is usually much more serious than lisping. By stuttering is meant an uncontrolled or spasmodic repetition of sounds, syllables or words. About 5 children out of 1000 are affected with mild stuttering and 2 out of 1000 with stuttering of severe character. About 15 more children are affected with various forms and degrees of lisping.

It is difficult to analyze briefly the different causes for these speech defects. In stuttering the following factors may operate singly or in combination: nervous shock; intense fear; anxiety neurosis; exhaustion diseases; neuropathic disposition; imitation. Mental factors are very important and one authority has gone so far as to describe stuttering as "a diseased state of mind which arises from excessive timidity." Another writer refers it rather vaguely to an abnormality in the "region of personality."

Only a very small proportion of all speech defects can be ascribed to malformations of the speech organs or to specific paralyses or to tied tongue. Practically all cases of "lisping" are functional in character, due to subenergetic phonation, absence or faultiness of imitative standards, lack of ear conscience, persistence of baby talk, lack of physical tone and lack of emotional tone, defective breath control, etc.

It is difficult to generalize in this field; each case, whether of stuttering or lisping, is individual. It may have a medical aspect; but usually the problem is one of education or reeducation, and often the approach is indirect. Fortunately most speech defects are definitely curable, and many are as definitely preventible. It ought to become part of our general Americanization program as well as general health program to insist on better opportunities for conversational English in the early years of childhood. Surely primary teachers ought not to hasten their pupils to read and write before they have really learned to talk; and kindergartners should make oral expression one of the chief objectives of their educational program. If nurseries and kindergartens meet the responsibility which is before them in this important field, they will not only improve the speech of all of their immediate charges but may aid in the development of corrective measures which will reach the speech defective while still pre-school age. Timely recognition and timely treatment here as elsewhere make for larger results at a smaller outlay.

VIII. Mental Deficiency

Nearly all cases of mental deficiency are recognizable and become established before the age of six. In about three cases out of four the causal factors are hereditary; in one case out of four we have to reckon with some inflammatory or toxic disease, or some traumatic damage which usually occurred at birth or early childhood and brought about an actual destruction of brain tissue or an arrest of its development. Feeblemindedness is always associated in some way with an incomplete development of the cerebral cortex.

The control and treatment of feeblemindedness, therefore, must take due account of the pre-school period. The wisdom of ample public school provisions for mentally deficient pupils is becoming gradually more evident. It serves no purpose to emphasize the fact that feeblemindedness is incurable. It is more important to recognize that most feebleminded children respond to the right kind of training and that with certain readjustments and safeguards they can maintain a place for themselves in community life. It is one of the functions of the public school system, both through state and local agencies, to provide special occupational training and perhaps even to assist in the vocational guidance and supervision of pupils who have had this training.

Inasmuch as proper training has unquestionably demonstrated its efficacy in the case of the mentally deficient children, it is natural to ask whether we can afford to neglect as completely as we do the pre-school development of these children. The present tendency is to delay their school entrance. They are usually slow to hold up their heads when babies, slow to sit up, to walk and to talk, and likewise slow to go to school. If a zealous parent enters a defective child in kindergarten at the legal age, the child is frequently sent home to wait another year; and even the special classes may exclude such a child on the plea that he is too young, and that he will be more ready in a year or two.

It may be questioned whether this policy is altogether justified, at least from the viewpoint of the educational psychology of the feebleminded. Would it not be educationally advantageous to furnish a sub-kindergarten type of training for the mentally subnormal in their nursery years? These are the years when they are most likely to be neglected or misunderstood. The defective child from three to six years of age frequently gets severe corporal punishment because he is not understood by his own father and mother; and it is during these years that he may be peculiarly troublesome at home. Sometimes the situation drifts into one of unconscious cruelty to the child and extreme vexation for the parent.

Many a mother who will not and probably should not send her defective child to an institution is entitled to some form of community assistance. More should be done to provide nursery facilities for subnormal children, and by concrete guidance to aid the mothers in the task of caring for such children at home. Too frequently diagnosis and advice are not forthcoming until the child has become of school age. This fact, which I have often observed in my own experience, betrays a serious defect in our present administration of child hygiene. Feeblemindedness is a developmental defect which, no less than rickets, should have the benefit of early diagnosis. To be sure we cannot cure feeblemindedness, but by timely diagnosis we can bring it under better control and may render a service to parent and child alike. And how much we could do in an educational way by giving more systematic attention to the pre-school years of the defective child, no one knows.

The net results of this survey of the status of the handicapped child of pre-school age leads to a few general conclusions and suggestions. It appears that he is in a somewhat precarious position and that he may become a victim of hardship and sometimes of actual injustice. He has no school status; and in a legalistic sense he has no educational rights, even though he may be peculiarly entitled to them. Whether he will receive medical attention will depend upon the quality and severity of his handicap and the perception of the physician. The psychological and educational aspects of his condition are in danger of being ignored, even when his physical welfare is not neglected. A careless faith is placed in the vague formula that he will outgrow his difficulties as he gets older.

Imperfect as our knowledge is concerning the development of young children, it is in advance of our provisions for their welfare and this knowledge should be more deliberately applied as part of our social policies. In the effort at application we shall come nearer to a solution of the problems involved. We should develop a specialized type of nursery and kindergarten service, which will be neither purely custodial nor conventional, but which will aim by educational procedures to reduce developmental handicaps; and demonstrate how similar measures can be introduced into the home. Even one specially trained expert kindergartner in a large city could render incalculable benefit to mothers of defective pre-school children, through methods of conference and demonstration.

The problem after all does not involve a staggering institutional program, but is one of engineering and requires a special adaptation of the same technique which is being so successfully worked out in the field of the visiting nurse and the visiting teacher. Public health nurses should in general be better trained to perceive developmental defects of young children and should play a more active part in this new kind of family welfare work.

A consecutive health and development supervision of pre-school children, the hygienic regulation of school entrance, and a special adaptation of nursery and kindergarten methods in behalf of exceptional children, educational social workers in the field of infant welfare, and special mobile teachers for home visitation and home training—these are some of the possibilities which a public mental hygiene of the future may have in store.

EDUCATION IN CHENG TU, SZE CHUAN

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Introduction

The city of Cheng Tu, far out in Western China, stands for a type of city as yet not much under the influence of the Occident. Factors that are very strong in education, business and outlook in the coast cities have penetrated to Cheng Tu only in weak or much diluted form. For this reason, it seemed worth while to take stock of the whole educational situation in Cheng Tu before the inevitable changes come, and to put on record the status of the school system in its first steps of transition.

Cheng Tu is over 650 miles in a bee line from the nearest coast, 1,000 miles from Shanghai measured in the same way, and 1,500 to 1,600 miles the way one has to travel from Shanghai. It is 1,000 miles from the railroad at Hankow, its most direct outlet, and some 360 miles from the railroad at Yun Nan Fu over rugged mountains and difficult travel by chair. This latter is a little used route. Cheng Tu is nearer in miles to the railroad terminus of India at Myit Kyina than to that at Hankow, but the rough mountainous country between, and the absence of any transportation but chair or donkey, makes this connection of little value. Its road out is either down one of two or three small streams to the Yangtze, and down the latter to the coast, or overland ten to fourteen days by chair to the river at Chung King or Wan Hsien and then down the river. Roads north, west and south only lead deeper and deeper into the wilds of mountains or deserts. These are the reasons for the isolation of Cheng Tu and in part for its present status in education.

In spite of its not being an open port, there are three consulates in Cheng Tu; and some foreign business houses have offices, managed, however, by Chinese operators. Then the missionary societies doing work in West China have many representatives and some headquarters here. These items are in large measure responsible for her forwardness, as compared with other cities equally isolated in Sze Chuan.

Cheng Tu is an old city. Evidence of its ancient origin and humble beginnings is found in the multitudes of graves and in the buried foundations, coins, pottery and implements uncovered in excavations within and around the walls. It has long been a provincial capital with traditions and a pride in the past. But with all this tendency to look backwards, Cheng Tu is a city, prosperous and distinctly forward looking. It is situated on the fertile and constantly renewed Cheng Tu plain which is still abundantly blessed by the great Kwan Hsien irrigation system, installed 150 years B. C. In these favorable conditions, the city has grown to a size comparable with Cleveland, Detroit or even Boston. Her population is not known, and a census as America takes it is nearly or quite impossible; but there is little doubt that there are 700,000 people living in Cheng Tu. There may be 40 or 50% more.

Cheng Tu has, around most of her people and business, an ancient stone-and-earth wall with four great double gates which close every night at dusk to keep out marauders. Many streets are paved with flat slabs of sandstone, but they are dirty and, when wet, very nasty. Most of them are narrow and overshadowed by awnings of mattings, by tile, or by some other material which prevents their drying out. In her central part is the old Imperial City, occupying about one-ninth of the city. This in turn is walled about, thus shutting it off from the life and rush of the business streets, and is divided by walls into more or less separate compounds.

The commerce of the city is done mostly on carrying-poles across men's shoulders. The small streams outside the south and east gates have many small boats and float great quantities of eatables and building materials, also many goods from the west and north coming here for transhipment.

Thus in many ways Cheng Tu is modernized, alive, active, progressive, and in other ways retarded, conservative, effete. Her school system is fully in accord with these characteristics as a city. It is related to them; a product of the same factors which have produced the city and all its contradictions, inconsistencies and incongruities.

The Range of Schools

The school system of Cheng Tu embraces opportunities for the student of every grade. There are kindergartens, primary and middle schools, normal schools, colleges and a university, for men. And for women there are the same from the lowest up through the middle and normal schools, but really nothing of college or university grade. The national government and that of the province and the city support many schools. Several private schools exist. Missionary organizations have schools of all grades. From middle or high school up, both technical and general education are provided.

Some of the newer schools are very good from a western point of view; some are bad. Some, too, of the old Chinese classics type are good; some are very poor. Some of them look much better on paper than they really are. Often they change from good to poor or the reverse; and the same school may be quite modern in its methods and tone one year, and within a year or two be as distinctly old style and eastern, or the reverse. No system of inspection or of supervision of quality of work exists outside the foreign schools. As President Beech of the West China Union University says, "Chinese educational matters are so kaleidoscopic at present that it is hard to keep track of them." One cannot say anything about them as true or untrue unless it be carefully dated and placed, for they are generally unsteady.

Primary Schools

Under this heading will be discussed the kindergartens and the Lower and Higher Primary Schools, everything below the Middle or High School, whether it be a government, private or missionary enterprise.

Starting with the kindergartens, three such schools have been organized and operated. Two are in the hands of the Canadian and American Methodist Missions respectively, and are for both boys and girls. They are conducted purely for the good of the children and their mothers. In some cases, a child thus cared for relieves the mother for work she could not otherwise do. The third kindergarten is much larger[1] and is a part of the system known as the First Provincial Girls' Normal School. It is exclusively for girls and seems to serve as a sort of model for the prospective teachers who are in training in the normal school. It is not used as a practice school, although it is held in close connection with the higher grades and under the same general supervision. President Liu, an executive of high order and a man of vision, is in charge of the system. The games and play, as in most government kindergartens, are essentially Japanese and not Chinese or European.

Lower and Higher Primary Schools cover four years each and pass the pupil into Middle or High School. The government provides four complete Primary Schools in Cheng Tu, each offering the full eight years of instruction. These are conveniently located in various parts of the city, taking their names from their locations. For administrative purposes, the city is a metropolis of two *hsiens* or districts, corresponding roughly to the American county. Consequently, for school purposes the city is divided into these two districts, Cheng Tu Hsien and Hwa Yang Hsien. Each *hsien* maintains a Lower and a Higher Primary School in the city. These are not as large as the provincial schools, but like them are for boys only.

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[1] For statistics see tables at the end of the paper.

These four government and two *hsien* schools spend much time teaching the characters themselves, i. e., their sounds and delineation, and some time in reading easy texts in them. The fundamentals of arithmetic, and the Chinese classics and history are presented also. Government readers are used throughout. These readers have simple selections from Chinese classics and history, old stories from other nations, and especially hero stories but with very little of mythology and folk lore. Most Chinese pupils adore Washington and Lincoln and know the hatchet and pig stories. The pupils are taught some nature study, handwork and music. The handwork includes cutting wood and making simple things of paper and wood. They often make decorations for their schoolrooms or even for the home, to be used on gala days. The music is largely Japanese, but several American tunes with Chinese words and poems are much used. "John Brown's Body" and "Marching Through Georgia" are the favorites. The writing of letters, business and social, and the preparation of essays and themes come in the Higher Primary. Hygiene is usually taught very well; not anatomy, but food problems, personal care of the body, sanitation, and health and sickness problems are discussed. Physical training is taught generally in a very serious fashion, influenced strongly by Japanese methods. Even the goose step from the Germans through the Japanese is practised. The use of Japanese methods and material does not come in through preference, but because no other way is known. At present, the administration would surely welcome some other plan.

Cheng Tu has four somewhat special schools of primary grade which resemble private schools. They have "pet names," i. e., names given them as special institutions. One is called, when translated, "Youths Strengthen the Country School." The translation of the others has not been obtained, but they are probably something on the same order. Their curricula are much the same as those of the government schools already sketched, i. e., the Government Curriculum or System of Education put out by a commission at Peking for the schools of the nation. Three of these schools are for boys and one for girls; the latter usually has over one hundred pupils.

For girls, the government provides a school in Cheng Tu of both Lower and Higher Primary grade, called the Yang Shih

Kai School, which is well patronized. The Cheng Tu and Hwa Yang Hsiens each provide a primary school too. But the finest girls' primary schools under Chinese administration are no doubt those in the First Provincial Normal School for Girls, directed by President Liu. Here is a Lower Primary of 66 girls used as a practice school (Fig. 1) for the girls in the Normal course and a Lower Primary of over 400 girls who are given the best possible instruction as a sort of model of what should be done. The Higher Primary is not over 30% as large, but is equally efficient. The place (Figs. 2, 3) is as neat and clean as an American garden, with plants, trees, shrubs and beds of flowers; and the buildings are very attractive, clean, light and airy, and in a fine state of repair. Quite a number of the girls are from out of town and are provided with dormitories in real boarding-school fashion. If any of the girls come with bound feet, the feet must be unbound and put on the road to recovery and soundness, before the little lady can be admitted to work.

In these girls' schools the curricula are essentially the same as in the boys' schools. Among the handwork courses, crocheting and sewing are taught. A child's whole outfit of clothing is made in the Higher Primary, by each girl. Even the use and care of the sewing machine are taught.

Two more schools of the above grade, but for boys, should be mentioned before turning to the Missionary organizations. The Cheng Tu Teachers' College or Higher Normal School maintains a supplementary Lower and Higher Primary as a practice school. It is in the same general compound as the College and Middle School, the old imperial city, but in a separate compartment. There is a dormitory section for boys from out of town. The Government Curriculum is well administered here. It is used essentially as prepared, but slightly modified in places. In the Lower Primary, one teacher supervises the first and fourth grades, and another has charge of the second and third. In the Higher Primary, one teacher is allotted to each grade for supervisional work. Some departmental work has been introduced, a teacher taking the same subject through several grades. The other Primary is in the First Provincial Normal School, where the eight grades are maintained as a practice school for the young men in the normal course, and is a fairly efficient school also.

Five Missions maintain Primary Schools for boys, and four of them also have separate girls' schools. Minor adaptations in physical training and in handwork are about all the differences in curriculum. In connection with the Union University and its Normal School for boys, there has been established a

Dewey Practice Unit for Lower Primary boys. They have a beautiful court and group of Chinese buildings outside the south gate and near the university. The seniors in the Normal School get their practice teaching here under careful foreign supervision, so the small boys really have very superior instruction.

Where the statistics are sufficiently analyzed to show the point, the enrollment in the Higher Primary is much less than in the Lower. This condition holds in all the Primaries of the city. The loss or break, however, is not at the end of the fourth year, but after the second and third years. As soon as a boy is old enough, 8 or 9 years, to have any economic value, his time is worth more to his parents and the family purse than it is to him, at least in practice, and he is kept from school and put to work. If it could be shown that the few years more of schooling would notably increase the lad's efficiency, he might be allowed to stay. This points the way for the schools that desire to turn their attention to vocational courses. Put in the manual training early and introduce such things as the boy can do when he is out, and yet not become a coolie. Supplement this vocational training with the usual cultural subjects, and in many cases keep the boy in several more years. The dropping out of school is not due to indifference, but to economic conditions. These schools must be kept up to supply boys and girls for the Middle Schools and Colleges if the latter are to be kept full. Illiteracy can never be notably reduced until some way be found to get all the little folks into some school and keep them there at least four to eight years.

The Middle Schools

Middle Schools in Cheng Tu have adopted the English name for the same grade of work to which the American name High School is given. They provide a four-year course well articulated below with the Primary Schools, and above with the colleges.

The Provincial First District Middle School is the largest of all and is supported by provincial funds. It is a boys' school, and furnishes very satisfactory opportunities so far as it goes. Never in China is so much money put into buildings and equipment as in America. The buildings are Chinese, of course, throughout. Some dormitory facilities are available, for quite a proportion of the boys come from out of the city, from market towns and small cities that do not have Middle Schools. Since this is a Provincial School, such outside pupils naturally come to it. There are, however, three other schools in the province of the same type and standing.

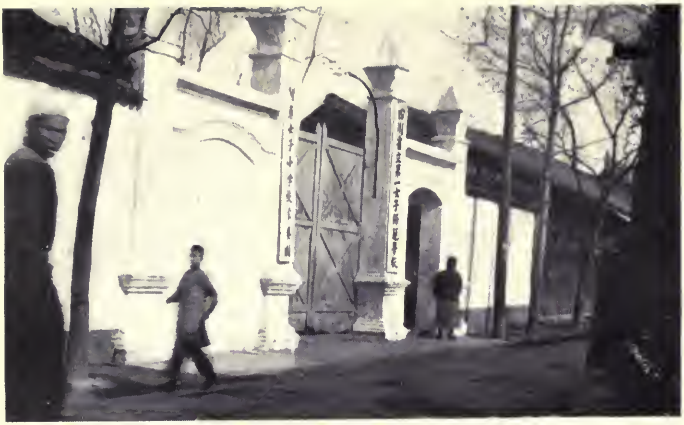

FIG. 1. First Provincial Normal School for Girls. Entrance to Primary Departments, with the gateman standing in the distance.

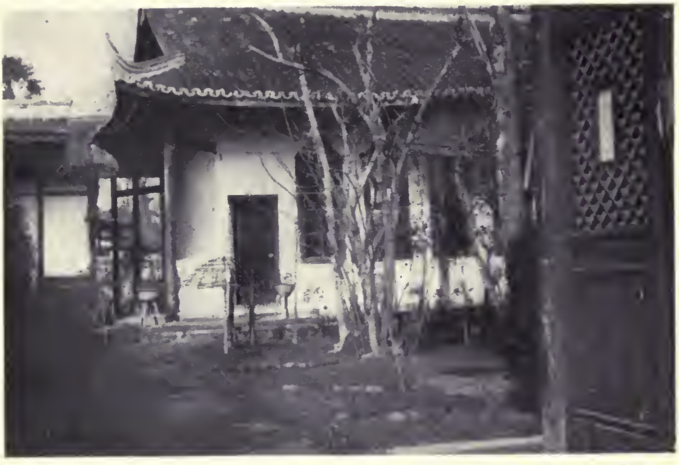

FIG. 2. First Provincial (Government) Normal School. Simple Chinese construction, each room a separate house, with passages, often covered, between. Neat and well-kept grounds.

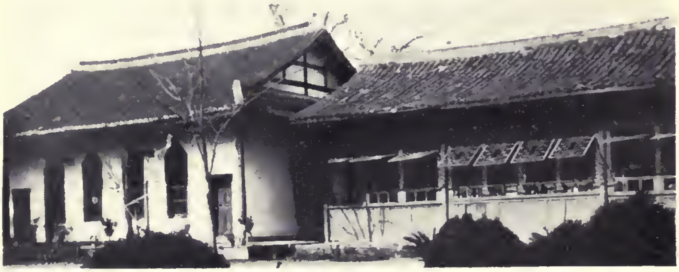

FIG. 3. Same. On the left a classroom; on the right, gymnasium; plaster walls, tile roof.

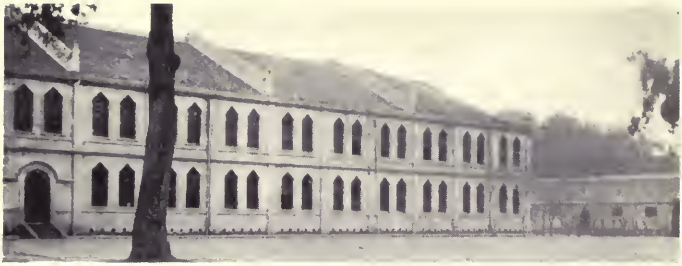

FIG. 4. Union Middle School dormitory and gate house. One-half of dormitory shows. Much of lower floor is used as classrooms.

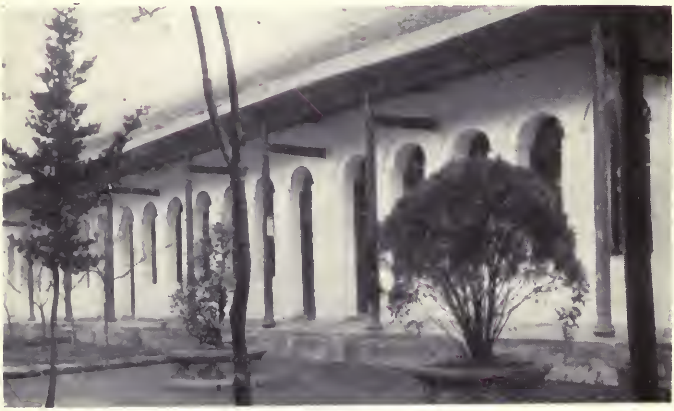

FIG. 5. Same. Court and recitation hall. A row of rooms, each entered from the covered walk along the side. No doors inside; solid walls between rooms.

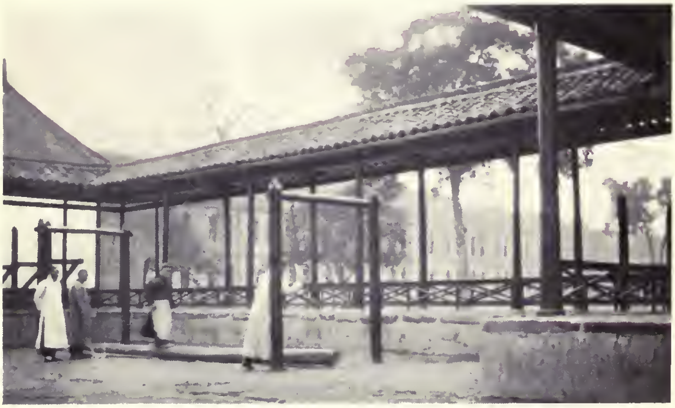

FIG. 6. Same. Open court, covered walks; wave bridge, consists of a squared log suspended by two chains at each end. The game is to walk it while it is swinging end ways.

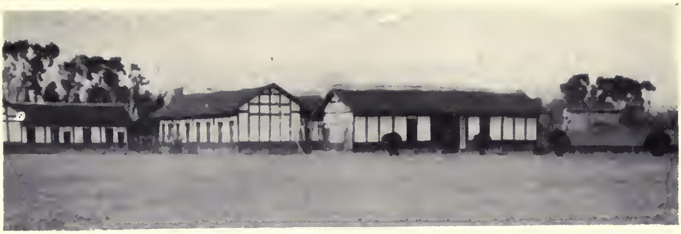

FIG. 7. General view of buildings of Union Middle School of W. C. U. U. "Bitou" construction, so common in China. Five or six buildings around a court.

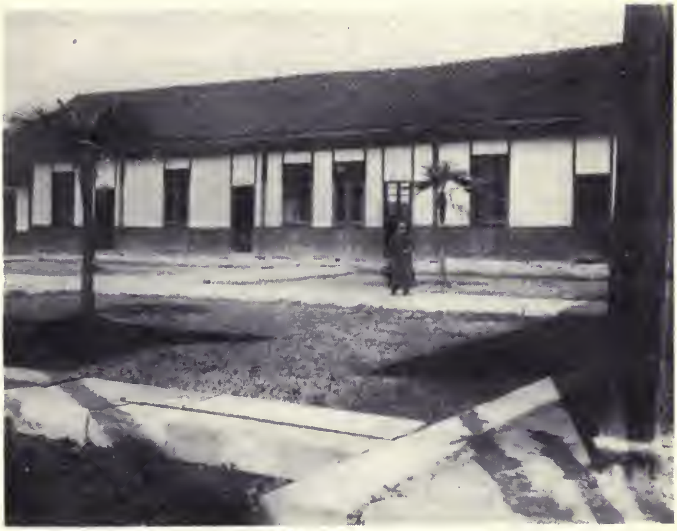

FIG. 8. Same. A single building looking across the court with its stone walks and grass plots. Three or four classrooms in a building. No doors between rooms.

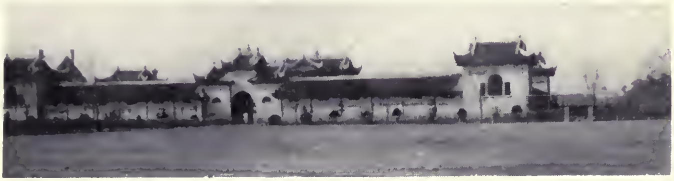

FIG. 9. Dormitory provided by Baptist Mission for Union Middle School. Built of blue-gray brick with tile roof.

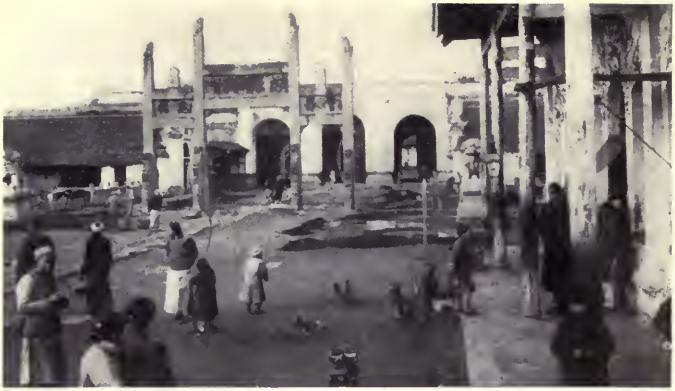

FIG. 10. Government Teachers' College for men. Main entrance. This was the inner gateway to the old Imperial City and the court between it and outer gate. Buildings on flanks used for military stables; heaps and ridges of stable waste drying in the court.

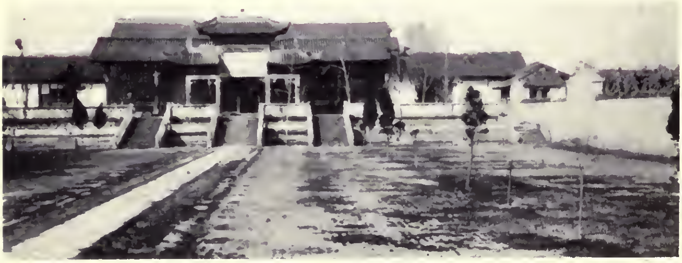

FIG. 11. Same. Court and Assembly Hall beyond inner gate. No wall on this south side of building.

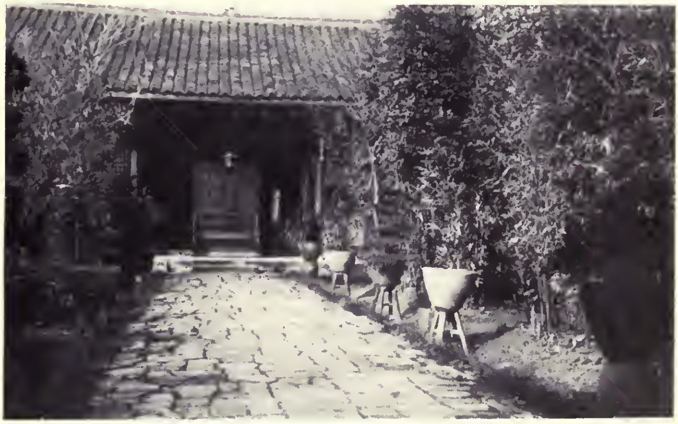

FIG. 12. Same. Entrance to Reception Hall. All open on this side except for the screen in front. Windows are lattice with paper pasted over. Tea is served, also elaborate Chinese dinners, behind the screen.

The next Middle School in point of numbers, as also in territory tributary, is the Cheng Tu Union Middle (Figs. 4, 5, 6). Its contributing area embraces sixteen *hsiens* grouped in central Sze Chuan around the capital. Together these *hsiens* constitute the Cheng Tu prefecture, and its chief city was and often still is designated a Fu city, Cheng Tu Fu. This school was established under the Manchu Dynasty, but has been modernized with the new régime of the Republic and the national course of study. Theoretically, it is a modern school throughout. Practically, it uses some older methods more or less intermittently, depending upon the teacher. Inspection and standardization are not enforced in the schools of Cheng Tu, or of China, for that matter. Three per cent of the taxes of the sixteen tributary provinces is designated for this school. A new class enters every semester, which means that eight classes are proceeding through the school all the time, with a commencement at the end of each semester and some forty or fifty students in each graduating class.

The two *hsiens* of the city, Cheng Tu and Hwa Yang, each maintain a Middle School in addition to the one they help support with the fourteen other *hsiens* of the prefecture.

Four cities or, better, a group of citizens from each of these cities now residing in Cheng Tu, maintain Middle Schools at the capital. Some of these schools attain good size; one is quite small: Tze Chow and Sui Fu have the largest. All conform, in theory at least, to the curriculum of the government. These schools are open to any one on payment of a moderate tuition, but are primarily for the boys of citizens of the several cities.

Cheng Tu maintains a small municipal Middle School of about 140 boys, in which the principles of municipal government are emphasized, but even in this institution the fundamental curriculum is adapted from the government system.

Che Kiang, a province on the coast south of Shanghai, has a considerable number of business men in Cheng Tu. These have organized into a Che Kiang Guild, and this guild maintains also a Middle School, primarily for its own boys. The school is small, but is counted among the more efficient.

The technical colleges and schools usually have some sort of an academy or preparatory school, which of course is of Middle School grade. Some of these provide the whole four years' course, but probably give more attention to the upper classes, to which pupils not fully prepared to enter the college, drop back for one or more years of work.

In the statistics of four government colleges, the numbers of students actually in the college and in the preparatory school are not designated, but we have verbal testimony from the teachers or officials that such preparatory work is provided. These four are the Law, Foreign Language, Commercial, and Agricultural Colleges. Their work is more or less pointed toward the work to follow in the college.

Two of the professional colleges financed by the government maintain well-equipped Middle Schools, whose work is more or less separate, yet closely related to the professional work above. The Cheng Tu Teachers' College thus has a well-organized and equipped Middle School giving a full four-year course. It occupies classrooms and dormitories in the Imperial City, but in separate compartments from the college. Not only does this school take the graduate of the Higher Primary approaching the Teachers' College through the four years of training, but it takes graduates of Middle Schools all over the province and puts them through the last year of its curriculum before admitting them to the college. This insures a more uniform preparation and a higher grade of work in the college.

This Middle School is the only one in the province working on the Dewey plan. In the first two years, pupils take the same work as in other good Middle Schools, but in the third and fourth years they elect their courses in any one of three lines. Literature and arts leads to legal, literary and commercial professions; agriculture leads to agricultural pursuits, if possible, through the Agricultural College; and the industrial course leads to manual training and technical professions. These three courses are but introductory and preparatory for higher college and university work. It is expected that more vocational training will soon be gradually introduced into the first two years.

The Technical College has its own preparatory school, a first-class Middle School located some two miles away, but organized to articulate closely with the college. It is under the provincial government, as is the college above it, and is sometimes called the Technical Middle School, but officially, the Academy of the Technical College. This institution gives a full four-year course, developed to be followed by a more advanced college course. The several departments are: (1) Chemical Industries, (2) Mechanical Engineering, (3) Dyeing and Weaving, (4) Mining and Metallurgy. All but No. 3 lead directly into the Technical College, but that one has no corresponding college course.

All the above Middle Schools are exclusively for boys. There is no Middle School opportunity for girls in Cheng Tu except in the Missions and in connection with the Normal

Schools. The largest of these is the one constituting a part of the First Provincial Girls' Normal School under the presidency of Mr. Liu. Students are put through the government curriculum in a modern up-to-date way. Handwork, manual training, domestic science, including cooking (both Chinese and foreign), and a generous allowance of physical education and hygiene find place here. The place is beautifully clean, neat and attractive. The girls are strong, wholesome, fine-looking young women. If they come with bound feet, they must have them unbound and started toward normal conditions at once. Nearly all the teachers here, at present, are men; but there is a matron or preceptress, and women teachers will be employed when they can be found. Many of the girls live in dormitories provided on the grounds.

Among the schools of Cheng Tu having "pet names" and standing for special ideals are two combination Normal and Middle Schools for girls. One is under government control; the other is a private institution. The former belongs to some minor political party, but receives state aid. The other is distinctly socialistic in its ideals and tendencies. It stands for equality of rich and poor, and of men and women. It is the only school reporting specifically the teaching of the phonetic script, but undoubtedly is not alone in this work.

Two other Middle Schools, both for girls, are provided by the Canadian and American Methodist Missions respectively. They are standard, modern, and are doing excellent work. The last to be mentioned is a Union Middle School for Boys, provided by the united efforts of the five Protestant Missions doing work in Cheng Tu. The school is provided with classrooms (Figs. 7, 8), dormitories (Fig. 9), and playgrounds in the spacious campus of the Union University. Its teachers are partly foreign and partly Christian Chinese. Its spirit and work are fine. It is in close proximity to the university and is intimately connected organically with the latter. It has a Chinese principal working under the president of the university, and the school could be called the Academy of the University.

The following is condensed from a paragraph on page 5 in the 1919 annual report of the West China Christian Educational Union. The Union had adopted in 1913 essentially the revised curriculum of the Chinese government. "In the Middle School the requirements have not been found satisfactory. Too many subjects treated in a scrappy fashion have made for superficiality and cram. In 1918 a radical revision of our curriculum was made. The first two years give a required course with few options. In the third and fourth years three types of courses are provided, General, University Entrance and Vocational. Electives in these two years include Commerce, Religion, and Teachers' Training, etc. . . . It is interesting to note that the Model Middle School connected with the Provincial (Government) Higher Normal School in Cheng Tu has just adopted a course almost identical with that of the Union, and that the Board of Education in Peking has approved of it as an experimental course." This agrees somewhat with the description of the Middle School of Teachers' College given by the officials in charge and is probably a description of the same thing. They mentioned literature and arts in the general course and agriculture and industrial courses for vocational work and of course prepare directly for their own college entrance.

NORMAL SCHOOLS

Normal schools in China are of two kinds, Higher and Primary. The former prepare teachers for the Middle Schools and the latter for Primary Schools. China has six of the former for men and one for women. These are all national and are supported by the government. One of the Higher Normals for Men is in Cheng Tu and is called the Government Teachers' College. The others are distributed over the Republic, one each in Wu Chang, Canton, Nanking, Peking and Mukden. The Higher Normal School for Women is also in Peking. The one at Nanking is recently opened to women and this year enrolls about forty.

The one at Cheng Tu is primarily for three adjacent provinces, Sze Chuan, Yun Nan and Kwei Chow. Students gather from all three, and may come from any province. Mr. Yang, the principal, who visited American colleges and schools two years ago, says these Higher Normals are much like the Teachers' Colleges in our state universities and likened his particularly to the one in Iowa. Effort has been made to make these institutions attractive to the young men. Instruction is free, and even board is given in some. Subsistence was very generally furnished at the start, but it is hoped now soon to be able to withdraw this favor (Figs. 10, 11, 12).

Subjects taught are divided into two classes: the technical and subject-matter courses. In the former list are psychology, ethics, logic and education. Both the history of ethics and history of education are included. The principles of teaching and practice work form an integral part of the work. In the second list are: Chinese language and literature, English language and literature, mathematics, chemistry, biology, physics, geography, history and agriculture. A student is

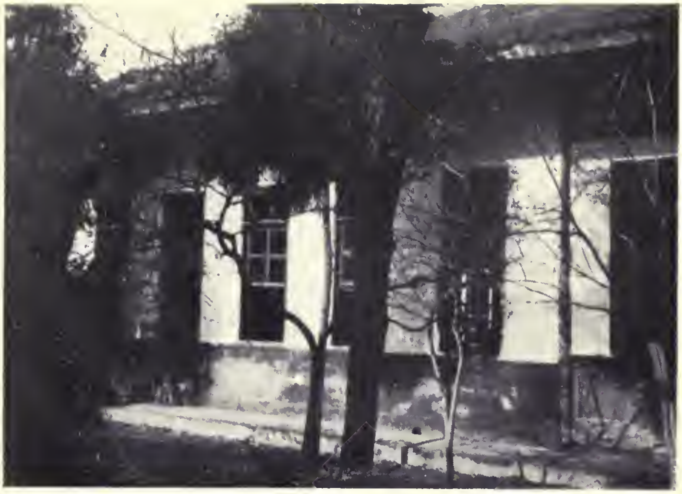

FIG. 13. Government Normal School for Girls. Classrooms seen across a narrow court rich with vegetation.

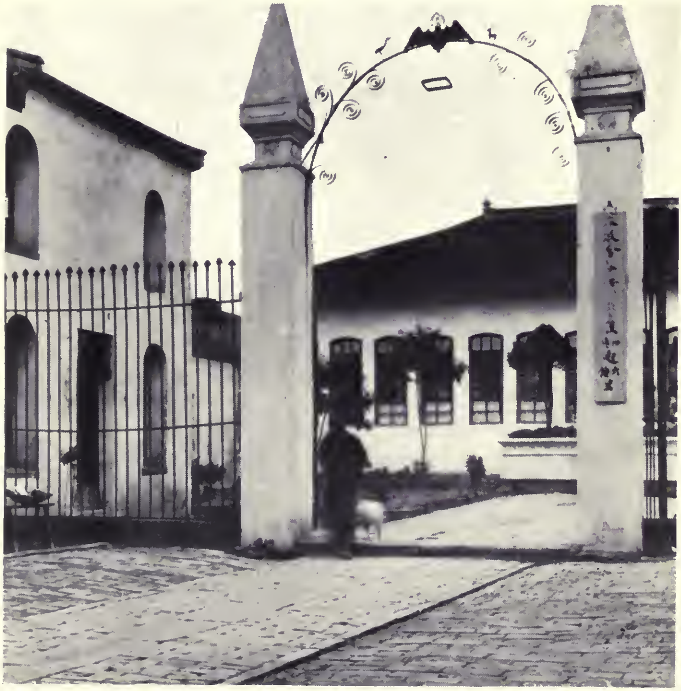

FIG. 14. Entrance and buildings of Government Technical College. Pavements are stone blocks. Well-lighted recitation hall and shop.

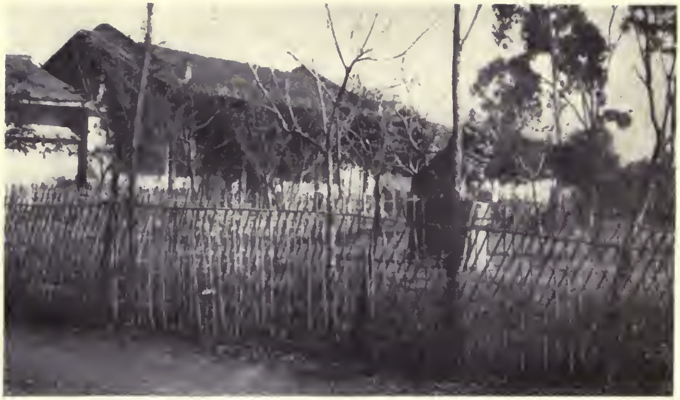

FIG. 15. College of Chinese Classics. Bamboo lattice fence, stone lion in court. Buildings purely Chinese, brick and plaster with tile roof, all gray blue. Each building one room.

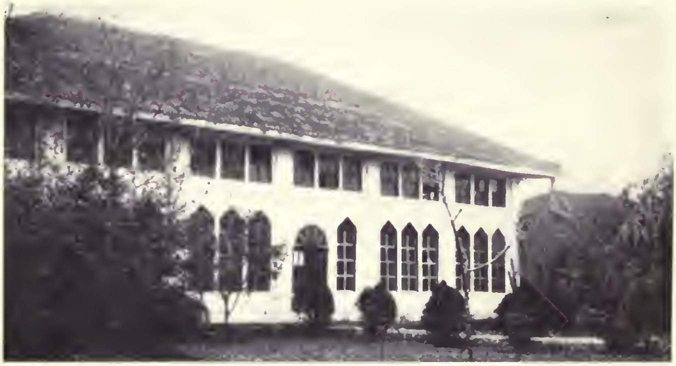

FIG. 16. Foreign Language College. Recently built, modern construction. Grounds beautifully kept. Dormitory above, classrooms below.

FIG. 17. Government Commercial College. A corner in the grounds. Offices in distance.

required to take all in the first list, but may elect at least two from the second list. Every senior obtains practice work in the Middle or Primary Schools under the same administration. Graduates go out as principals and as teachers in Middle Schools. This institution gives its work in three years following the one year of preparatory work required at the beginning. Commencement exercises are held; and certificates of graduation are issued, but no degrees are conferred.

The Primary Normal Schools are not national, but look to the province for their support. Several have been organized in Sze Chuan; Chung King, Tze Chou, and Cheng Tu are among the fortunate cities. In fact, Cheng Tu and Chung King each have two, one for men and one for women. Their function is to prepare teachers for the Primary Schools. In them essentially the same arrangements for tuition and subsistence are made as in the Higher Normals or Teachers' Colleges. The technical work in the Primary Normals is much the same as in the Higher, but the subject-matter courses are such as are taught in the grade schools. In both classes of Normal Schools, the teachers are men, for no native women in China are yet prepared to teach in such schools.

Since these Primary Normals receive as beginners Higher Primary graduates, they do not rank as colleges at all, but are doing work of Middle School grade. The First Provincial Normal School for Boys has practice work in both Lower and Higher Primary Schools which are managed for that purpose. The First Provincial Girls' Normal School has often been referred to as Mr. Liu's school (Fig. 13). It is probably as fine a native girls' school as there is in China. The atmosphere is fine. The ideals are high, and scholarship is kept up to as high standards as possible, considering the girls who come. The students usually come with only primary preparation. Such pursue their work here five years before graduation. Those who come with a full Middle School course finish here in one year. About 30% of the pupils come from Cheng Tu, and the rest gather in from all over the province. A dormitory is provided for all, but a nominal sum is charged for subsistence. These girls go out and actually organize primary schools all over the province. They are taught so as to have as much breadth of experience and vision as possible, and must be real centers of inspiration in every village and market town they reach.

Under Middle Schools were mentioned two girls' schools which are a combination of Normal and Middle Schools. One has an attendance of two hundred, and it prepares teachers to foster the influence of a political party or faction.

Neither seems to be attaining its ends as a Normal School or having much influence as a Middle School.

The Mission organizations have two Union Normal Schools, one for girls in the city, and one for boys in connection with the university outside. Both are well organized for their work. The former has a group of Chinese buildings somewhat adapted. The latter occupies a part of the university equipment. Some of the teachers are Chinese, some foreign. Both schools are doing fine work. The men's school stands for a higher grade of work but no higher standards of scholarship. Both maintain dormitories for the students. Both have practice schools. The men use the boys in the Dewey Practice Unit. The girls take practice work in the Primary Schools of the Canadian Mission. The curricula in both are partly technical and partly subject matter and are taught in three-year courses.

This equipment for the preparation of teachers is now being worked to a capacity of 650 men and over 200 women, less than 900 teachers in preparation. This number would not be enough to supply the schools of the city if half the youngsters were in school. There are now over 900 teachers in the city, and not one in fifteen of the children of school age is in school. The case seems more serious when one notes that there is no other teachers' training course in the whole vicinity. These few schools must equip teachers for the whole prefecture.

The Colleges and University

Under this heading will appear seven separate government colleges and the various colleges constituting the West China Union University. The Teachers' College has already been discussed among the Normal Schools, but it could just as well have been put here, because its work is of college grade and its entrance requirements are the same as those of the best colleges in other fields, four years of Middle School.

The other institutions doing full-grade collegiate work are the Technical College, the College of Chinese Classics and the Foreign Language College. The first is situated in the southeast quarter of the city, and occupies a group of small Chinese buildings (Fig. 14). It offers a three-year course along each of three different technical lines, and requires Middle School graduates other than those coming from its own Academy to spend at least one year in the preparatory work. It has been established a little over ten years and now has more than one hundred graduates. Chemical industries, mechanical engineering, and mining and metallurgy are the three lines along which the offerings are now grouped. For a few years after its foundation the school offered a course in ceramics, but this was discontinued because of the expense of getting clays suitable for anything but crude, plain work.

In this technical institution the only fundamental science taught with laboratory work by the students is chemistry. The room is fitted up with individual desks, running water, gas and a good equipment of chemicals and glassware. Most of the stock was purchased over ten years ago, at the founding of the college just at the close of the Manchu Dynasty, when there were more money and foreign teachers in some departments. Recent purchases have been very small, just the most necessary articles as the supply becomes exhausted. Some chemicals bore the name of Merck; others were made in Shanghai, and still others in Japan.

In physics there is quite a stock of demonstration apparatus well kept, but no serious laboratory work by students is attempted. The mineralogy and geology likewise are without laboratories. In metallurgy, some assaying and other testing are done by students. In surveying, field work with instruments is done. Drawing and lettering are taught. English is the only foreign language.

Machine shops for working wood and iron are maintained. A ten-horsepower gas engine is used to furnish power for the shops. A gas generator stands beside it, which produces CO and H from coke and water to be used in the engine. Some machines in the shops were foreign made; others were made on the spot. All machines were small, and most of them were ten years old. A heavy, cast-iron base, 5 or 6 feet long, for a lathe, had just been made in the foundry. The work of casting and finishing was very well done. Among the machines were planes and lathes for wood and metal, drill press and band saw. Four or five forges with air blast made ironworking possible. In the molding and casting room was a good equipment. Models of wheels, frames and various machine parts were made in wood and the pieces cast in iron. Pig and scrap iron were used, but no ore. Melting was accomplished in a pot about 2 feet high and 15 inches across, made of iron lined with clay and heated over a flame of artificial gas and air blast. The pot sat on a tiny brick frame outside the building, and when hot was swung into the moulding room on a crane. Several apprentices were at work in the shops, moulding and forge rooms, even during a strike vacation. These serve as assistants when students come in.

The institution has quite a museum. Model machines of many kinds, chemicals, leathers and many other preparations made by students were shown. There are small collections of ores, minerals and raw materials.

A technical office is maintained by the government in Cheng Tu, which is in no sense educational, yet is in the closest touch with the Technical College. Some of the teachers are in charge of departments in the office, and materials for study come from the office to the college. The office has four departments: (1) Chemical Industries, (2) General Chemical Analysis, (3) Dyes and (4) Mining and Minerals.

The College of Chinese Classics (Fig. 15) was organized about fourteen years ago, 1908, and is pretty well attended by mature students who come and go rather freely. There are very few about it at any one time, yet in a year a good showing is made in the enrollment. In this institution the Chinese classics, history and philosophy are taught from the Chinese-Confucian point of view. It is said to be a sort of Confucian school, but is not one of the old type. It has been, so far, impossible to find just what the difference is between it and the old type, for men familiar with its workings say it does not employ new, Western methods, but the students study and the teachers teach in the old, time-honored way. Some have found in its methods a touch of the new. It seems that a dozen years ago, when the new education was getting started, a few teachers and devotees of the old classical education feared that the old would be destroyed or at least neglected if something were not done, so organized this school either as a mild protest or a compromise. Its persistence and its imminent downfall are both forecast. It is located almost at the corner of the Union University grounds outside the city walls and in a quiet, shady, attractive compound.

The third of these better professional schools is known as the Foreign Language College (Fig. 16). It is located in the northwestern part of the city in what is called the Manchu City, but outside the Imperial City. A full four-year course is offered beyond the Middle School; and, as stated above, there is a Middle School carried on with the college, which cares for any who come not fully prepared. Its work compares well with the arts college in America except in the full absence of science. This might set it closer to what is sometimes called the classical course in an arts college. Greek, Latin, English, French and Chinese languages and literatures are taught, together with the history of literature, philology, mythology, philosophy, logic, sociology, general history and histories of certain nations. A fine modern building for dormitories has been erected. Classes meet in Chinese one-story houses. The work seems to be of good quality. Most of the teachers are Chinese, but some foreign help is employed.

Beside these three better schools there are three schools doing a grade of work not quite so fully collegiate. Their preparatory schools take a relatively larger place and are not as sharply differentiated from the higher work. The first in point of numbers is the Law College, located in the western part of the city. Its mission is to teach Chinese law. This is a strange body of material. In China there is not much law beyond custom and the will, judgment and prejudice of the court. So, in a way, the Law College is in a peculiar position. In its curriculum are several courses designed to broaden the vision and powers of the student beside the courses in law and history. Many students feel that the law gives a man the best opportunity nowadays in public life. This school keeps more aloof from its sister institutions than any other.

Another of these three schools is the Commercial College (Figs. 17, 18). Its name suggests its emphasis. A considerable portion of its work seems to be not of real collegiate grade.

The third is the College of Agriculture, outside the city toward the southeast, along the south bank of the Min River, and perhaps one and one-half miles from the east gate. Here a tract of land embracing a hundred acres or more is devoted to planting, cultivating, experimental horticulture and agriculture (Figs. 19, 20). Very little attention is given to animal husbandry, breeding, soils and farm mechanics. The little buildings are neatly kept, and the gardens and flower plots, the nursery rows and mulberries are very nicely planted and cared for. Boys are here given much that will be of value to them, but one wonders why not more. So much could be done for Chinese agriculture, in horticulture and forestry and in other lines that are untouched at present that one dislikes to pass the College of Agriculture with so little said. It has much possible growth and usefulness ahead.

These seven institutions make up the group of government colleges. Their funds come from the government treasury; but in spite of a rather generous policy in spirit, the funds have been greatly lacking recently because the soldiery is getting so much of the public money. Schools have to subsist on 20 to 60% of their accustomed allowance this winter, and the circumstances promise nothing better. This may be partly explained by the fact that, although the colleges are called government or national schools, their funds really are designated out of the provincial tax receipts raised for national purposes. The government really never handles the funds for such schools in the provinces. Hence, if the soldiery gets the first grab at the provincial treasury, there is little left for schools. This shows why government education succeeds so differently in different provinces. While schools in Cheng Tu, Sze Chuan, are forced to close down, Nanking in Kiang Su has flourishing institutions of the same class.

Some of the friends of education, both Chinese and foreign, are looking forward to the time when these seven institutions plus a first-class medical college and possibly one or two others shall be federated or combined into a real, thorough, efficient university, comfortably housed in a fine suite of buildings in the Imperial City. Considerable portions of this "city" are in ruin and disuse at present. Military horse stables occupy a part. Probably the College of Agriculture and the Technical College should not move into this area, but perhaps the other five could develop there. Such an amalgamation of all the higher education supported by the government in the city would dignify the whole effort, unify and standardize, as well as correlate, the work, and economize on teachers and buildings. The dormitories would probably have to be outside the Imperial compound. It may be of interest to know that the site of the Teachers' College is about the same in this court as that of the old examination booths where thousands of men strained every mental thread to meet the rigid tests put to them.

The West China Union University

This institution is the only university in all West China, an area estimated at over 300,000 square miles, with a population of nearly 100,000,000 people. It is the crowning piece in the purely Christian educational system of West China. The constituency cannot be worked out from the appended tables, because they cover only Cheng Tu. The following figures are taken from the 1919 report of the West China Christian Educational Union.

Lower Primaries	275	students	12,298
Higher "	53	"	1,512
Middle Schools	9	"	523
	337		14,333

These contributing schools are scattered over three or four provinces and maintained by a dozen missionary organizations. One must not infer that students from other schools cannot come to the university. Government and private schools may send their graduates here under the same conditions as do the Mission Schools.

The university buildings occupy a tract of about 120 acres lying near the south wall, but outside the city. The buildings are grouped and distributed over the grounds to give the appearance of spaciousness so much appreciated here both by Chinese and foreign visitors and residents. The buildings are substantial and attractive (Figs. 21, 22, 23). Residences for faculty and administration fringe the campus lots.

The faculties now number about fifty teachers, seven of whom are Chinese. The administration, control and support come primarily through a Board of Governors selected from members of the five co-operating missionary societies at home. The societies are the American Baptist Foreign Mission Society, Church Missionary Society, Friends' Foreign Mission Association, and the boards of the Canadian Methodist Mission and the American Methodist Foreign Mission. There is a senate or local board which includes many of the faculty, members and representatives of the missions interested.

The institution began with two faculties, Arts and Science, in 1910, and has made much growth since, both in scope and students and in influence on the community. It now comprises six colleges—the two above, together with Religion, Education, Medicine and Dentistry. Its instruction is further divided horizontally into Junior and Senior divisions of three years each. In the former, the courses are general and tend to even up the preparation of the pupils. Students coming with adequate preparation tested by examinations may omit the first year. In the latter, the courses are specialized in all six faculties or colleges, and make splendid provision for the individual needs of the men.

Of course, it is still in its infancy, even with all this growth and usefulness at the end of ten years, but it is a child of rich promise, and must continue to exert an increasingly important influence on matters educational, social and religious in West China. It is the only institution in its territory granting degrees.

SUMMARY AND CONCLUSIONS

The statistics bring out very clearly a few facts which should be stated in words to be appreciated. They will appear here. First, a comparison of the numbers of pupils reached by the Mission Schools and the native schools shows:

	Boys	Girls	Total
Mission Schools	1268	656	1924
Native "	6775	1845	8620
Totals	8043	2501	10,544

Of all the girls in school in Cheng Tu, about one-third are in Mission Schools and two-thirds in native schools. Less than one-fourth of the total attendance is girls. About 18% of all people in school in the city are in Mission Schools. It is rather striking what a large proportion of the education is Christian. Of course, it means a large proportion of China's educated (more or less) people will have had Christian training. The comparison of those in colleges shows at present only about 6% in Christian colleges. Christian collegiate education is just begun in Cheng Tu.

The number reported in colleges is 1,460, a number already shown to be too large for those doing collegiate work. Even if it be reduced to 1,000 and the loss added to the Middle and Normal School totals, we have 3,711 in Middle and Normal Schools against 1,000 in college. The comparison is not fair, because a larger proportion of the college than of the Middle School students come from out of the city. I think, however, that, when all is said, a larger proportion of students who go through Middle School go to college than in America. This cannot be proven, because statistics to show the sources of the students are not available.

One might think too that nearly every one in the Lower and Higher Primary goes on to Middle School if he did not note the same relation between these schools. If one-half of the Lower and Higher Primary numbers be compared with the Middle and Normal School numbers, it looks as if more per year attended the higher schools. This appears in the figures because so many come into the Middle and Normal Schools from outside the city. Here the discussion of the various schools throws some light on the question, although statistics are wanting.

The disparity between the provision made for and used by the women and that for the men is very marked in the upper grades. Something like one thousand men of college grade, but not one woman, appear in the count; and no place for her to go if she desired to take more advanced work. In Nanking the native Teachers' College is co-educational, and in Canton and Shanghai the mission colleges are co-educational. In Peking a Higher Normal is provided for women. In Cheng Tu plans are developing for a women's college in the Christian offerings. The question might well be raised now, Why not open the doors of the colleges of the West China Union University to women on equal terms? If it cannot be done today, it can be before the women's college is well on its feet; and the organizers would do well to bear this in mind in making their plans.

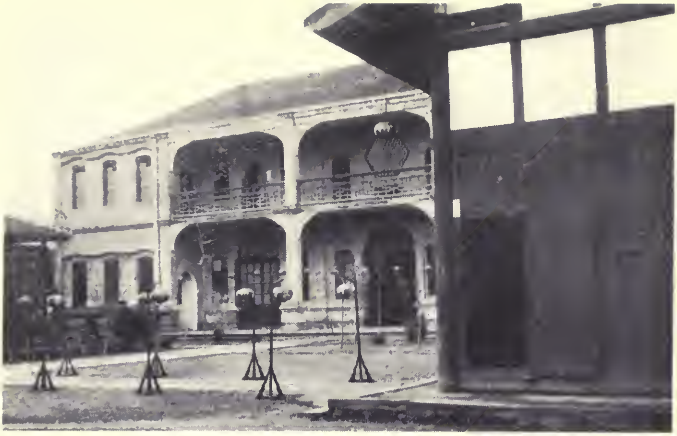

FIG. 18. Same. Main brick building in center. "Bitou" recitation halls. Reception Hall to the right. Lanterns in the court.

FIG. 19. Government College of Agriculture. Plots of plants and trees in experimental grounds.

FIG. 20. Same. Long, low buildings beyond paths, irrigation ditch and experimental plots.

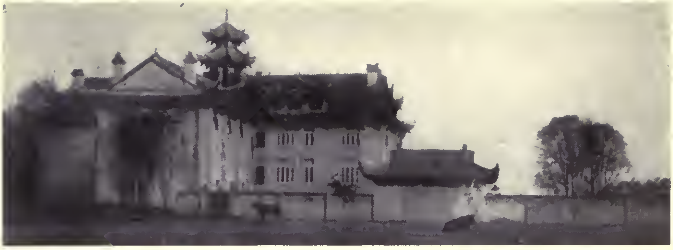

FIG. 21. Van Deman Hall, West China Union University. Blue-gray brick; tile roof with Chinese upturned corners. Looks very "foreign" in its present setting, but would look very "Chinese" in an American college group.

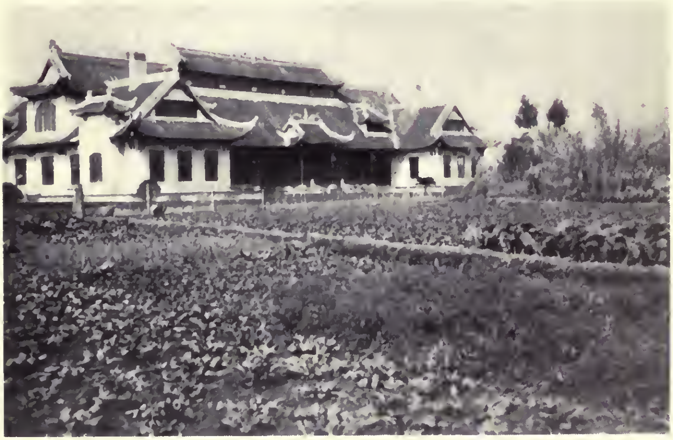

FIG. 22. Administration building from S. E. Looking across Chinese gardens, bamboo lattice fences and the road. All woodwork of building is highly colored with red, blue, green, black and white.

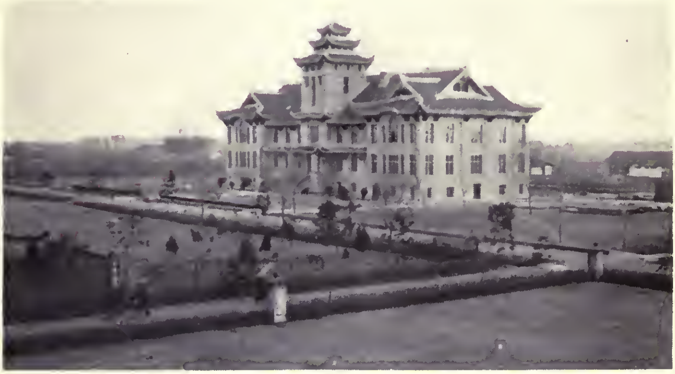

FIG. 23. Hart Hall from Van Deman, showing spacious grounds and roads. Irrigation ditches follow all roads. Lumber piled to the right is for new buildings to go up in the spring.

In the Middle and Normal Schools, the men count four-fifths of the enrollment, and in the Primaries, about five-sevenths are boys; but in the kindergarten, the girls are easily ahead, an earnest or a premonition of the turn the tables may make in a dozen or fifteen years. It should be noted too that in the mission primary schools the girls and boys are much more nearly equally provided for. See summary tables below.

Grade of Schools	*Mission*		*Native*	
	Men & Boys	Girls	Men & Boys	Girls
College	90	...	1370	....
Middle School and Normal[2]	315	93	2301	542
Higher and Lower Primary[2]	836	536	3104	1205
Kindergarten	27	27	....	98
Totals	1268	656	6775	1845

	Men & Boys	*Girls*	*Totals*
College	1460	....	1460
Middle School and Normal	2616	635	3251
Higher and Lower Primary	3940	1741	5681
Kindergarten	27	125	152
Totals	8043	2501	10,544

But the most telling disclosures appear when these generous figures are put over against the needs of the city. Any one looking at these figures would be much gratified to learn that more than 10,000 young people are using the educational facilities and that among these are 2500 women and girls. What a power these young people can be in the next generation! Estimates of the population of Cheng Tu run from 600,000 to 1,000,000. For safety, assume the lower figure. According to the American census figures, essentially one-sixth of the population are between the ages of 6 and 14. Applied to Cheng Tu, there are 100,000 children between these ages. A similar estimate would give some 45,000 of high school age and 40,000 of college age. Now stand these figures over against the numbers actually in the schools.

	Men	Women
Of College Age	20,000	20,000
In “	1,460	......
Of High School Age	22,500	22,500
In “ “	2,616	635
Of Lower and High Primary Age	50,000	50,000
In “ “ “ “	3,940	1,740

The comparison is the more telling when it is realized that great numbers of the men in college are not Cheng Tu men at all, and also a large number of students of Middle and Normal Schools are from outside; and that many are older than 14 years. Then look at the women and girls' side of the table. Not one boy in twelve is in the Primary Schools, and only about one girl in thirty is attending. Where are the others? In the High Schools, a little more than one boy in nine is using the privilege of his school, and not one girl in thirty-five is in her place. In college, no girl at all and only one man in twenty are in the school. Yet the schools are mostly comfortably filled. Provision is very inadequate.

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[2] These figures depart a little from those given in the recent report (1921) of Dr. I. B. Lewis, W. F. M. S. of M. E. Church. Her figures are sometimes larger, sometimes smaller. Totals essentially the same.

There are more than 1000 teachers in Cheng Tu in charge of these 10,000 pupils. In the various Normal Schools, Teachers' Colleges and in the two Middle Schools preparatory to the Normal Schools are found 325 girls and about 650 men. Perhaps 900 new teachers can be turned out every three years (the time required for the full course in the various schools preparing teachers). But as in America, some who prepare to teach never begin; many who begin serve only one or two years; and a considerable number enter the profession without going through the teachers' preparing school. The net results of all these variables cannot be known, but it seems probable that the training schools for teachers can but little more than keep pace with the needs of the present enrollment of pupils. This is certainly true if allowance be made for the scores and scores who when prepared go to teach outside Cheng Tu. There is no other place preparing teachers nearer than Chung King. How then are the schools to be built up? What would happen if Sze Chuan should enact a compulsory education law for every child from 6 to 14 years of age, and proceed to enforce it? If every person in a Middle or Normal School or in a college, no matter what sort of school it be, in the whole city of Cheng Tu should enter the teaching profession as fast as he graduates and if none should drop out of the profession, ten years would not provide more teachers than would be needed in Cheng Tu for those primary schools. There would be not one left for schools outside the city, nor one to enter higher education either as a teacher or pupil, not one to enter any other profession.

These deductions show in a general way how serious is the problem of education in such a country. An adequate system cannot be provided at once, nor in ten years, nor in twice that, even if there were the will to do it. Further, if the educational system should be multiplied by ten, a minimum to provide for the teaching of all from 6 to 14, the financial system of the province would be absolutely swamped. The housing and text-book problems are also serious ones. The logical conclusion is that universal education in China must be a matter of growth, to be attained only after many years of careful, continuous nurture. Cheng Tu is not behind the ordinary city, but it is far ahead of the *hsien* and market town and village.

Since democracy cannot succeed with an illiterate people, it is just as logical to conclude that democracy in China must come slowly; that several decades will probably not see real popular government in operation in China.

STATISTICAL TABLES

MISSION SCHOOLS[3], KINDERGARTEN TO UNIVERSITY

Organization	Grade of Schools	No. of Sch'ls	Boys	Girls	Total
Canadian Methodist	Lower Primary	3	181	...	..
" "	" "	2	...	174	..
" "	Higher "	1	50	...	..
" "	" "	1	...	45	..
" "	Kindergarten	1	7	7	14
" "	Middle School	1	...	31	..
American Methodist	Lower Primary	2	77	...	..
" "	" "	6	...	143	..
" "	Higher "	1	36	...	..
" "	" "	1	...	30	..
" "	Kindergarten	1	20	20	40
" "	Middle School	1	...	32	..
American Baptist	Lower Primary	1	97	...	..
" "	" "	1	...	83	..
" "	Higher "	1	40	...	..
" "	" "	1	...	35	..
Friends	Lower "	1	42	...	..
"	Higher "	1	63	...	..
Cath. Mission[4]	Lower "	1	175	...	..
" "	" "	1	...	26	..
Union Schools	" "				
" "	(Dewey Practice Unit)	1	75	...	..
" "	Middle School	1	135[5]	...	..
" "	Normal "	1	...	30	..
" "	" "	1	80	...	..
" "	Bible School at W. C. U. U.	1	45	...	..
" "	University	1	90	...	..

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[3] Data from West China Christian Educ. Union through Dr. Ida B. Lewis, American Methodist Women's Board.

[4] Data from French Consul Bodard through Dr. Ida B. Lewis.

[5] Another source gives 200.

NATIVE SCHOOLS[6]

School; Its Title or Name and Grade	No. of M'g'rs	No. of T'ch'rs	Pupils	
			Boys or Men	Girls W'm'n
Government Schools and Colleges:				
Chengtu Teachers' College Normal School	10	38	378	...
Middle School	2	20	169	...
Lower and Higher Primary	6	9	161	...
Law College	12	24	472 (7)	...
Chinese Classics College	6	12	86	...
Foreign Language College	7	19	116 (7)	...
Agricultural College	8	30	175 (7)	...
Commercial College	7	20	53 (7)	...
Technical or Artisan College	9	40	90	...
Provincial Technical Middle School	6	30	104	...
Provincial Schools:				
First Provincial Normal School	10	16	194	...
Lower and Higher Primary of above	8	23	213	...
First Provincial Girls' Normal School	12	30	...	166
Middle School of same	..	..	...	116
Lower Primary for Practice Work	..	..	...	66
" " not for Practice Work	..	..	...	415
Higher " " " " "	..	..	...	122
Kindergarten	..	..	...	98
First District Middle School	10	31	495	...
Lower and Higher Primary Schools				
Middle City	12	30	685	...
Southern "	15	52	578	...
Western "	5	39	502	...
Northern "	5	39	293	...
Cheng Tu Municipal School[8]	8	20	142	...
" Union Middle School (16 *hsiens*)	9	32	402	...
" Hsien " "	5	25	145	...
Hwa Yang " " "	5	27	141	...
Sui Fu Middle School	3	15	169	...
Tze Chou " "	4	17	171	...
Ch'u Tsai " "	6	19	126	...
Lo Ch'un " "	4	8	21	...
Che Kiang Guild Middle School	5	8	22	...
Cheng Tu Hsien Lower and Higher Primary	5	24	173	...
Hwa Yang " " " " "	3	17	125	...
Cheng Tu "[10] " " " "	..	..	...	100
Hwa Yang "[10] " " " "	..	..	...	100
Miscellaneous Schools:[9]				
Shao Cheng Lower and Higher Primary	3	12	130	...
" " Union Lower and Higher Primary	3	10	151	...
Yung " Girls' " " " "	6	16	...	102
Youths' "Strengthen the Country" L. and H. P.	5	28	93	...
I Chow Gov't Normal and Middle School[10]	..	..	...	200
Chao Ch'un Private Normal and Middle School[10]	..	..	...	60
Yang Shih Kai Gov't L. and H. Primary	..	..	...	300

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[6] Data furnished by Mr. Feng, City Comm. of Ed., through Dr. Ida B. Lewis.

[7] These four college lists probably each contain names of men not of college grade.

[8] Teaching City Gov't.

[9] Schools with "pet" names.

[10] Data by Mr. Liu through Dr. Ida B. Lewis.

THE PSYCHOLOGY OF SOLVING PUZZLE PROBLEMS

By Joyce E. Mather and Linus W. Kline

I. Introduction

The subject matter of the present report is a part of an experimental study of reasoning for which problems of a mechanical puzzle type were used for material.

The use of puzzles, other than the maze type, as a means for studying reasoning has been surprisingly small. Doctor Lindley (5) in 1897 appears to have made the first considerable use of several types of puzzles in his genetic study of puzzle interests. He found that puzzle interests, i. e., kinds of problems, among people change with age, that the change is from simpler to more complex forms of puzzles, and that riddles, rebuses and simple charades give way to conundrums, enigmas, word squares, hidden words and mechanical constructions. Ruger (6, p. 21-33) in his study of the "Psychology of Efficiency" used tridimensional puzzles, so called, made of wire. The solution of these problems involved removing some part from the rest, and as a consequence required manipulation and overt movements readily observable. Tait's Labyrinth Puzzle used by Lindley (5) requires overt movements and is of course readily observable. He chose it because: (1) it is sufficiently difficult of solution to require a number of trials, (2) the instructions of procedure are easy to follow, (3) a false beginning is soon apparent to most subjects, as there are only two correct ways for beginning.

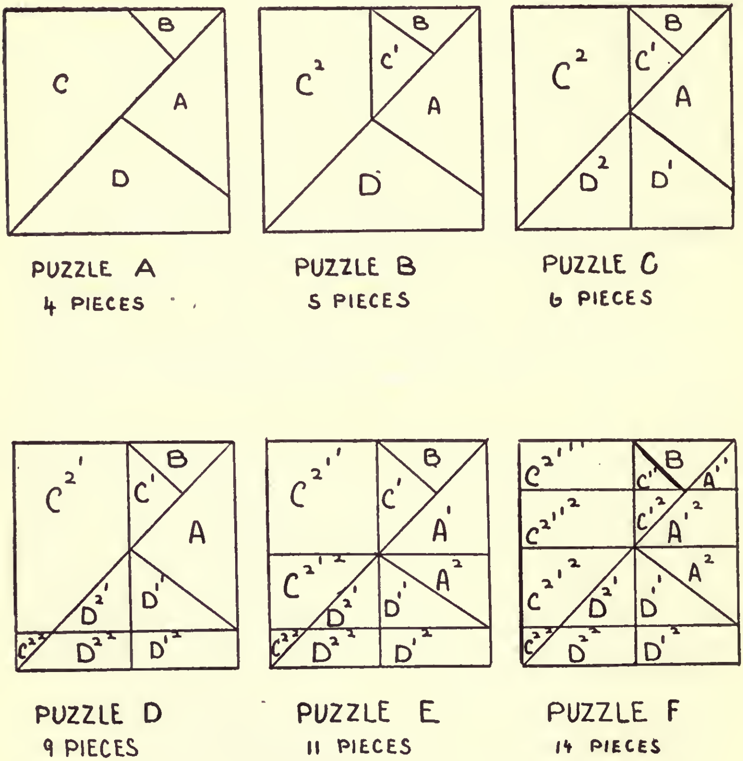
The results from solving Tait's puzzle show a large majority made a haphazard beginning at first and further that wide individual differences existed in the conception of the figure, often undergoing radical changes in successive trials. Solving tridimensional puzzles emphasized the same thing and in addition showed the application of a principle to a concrete situation. Ruger (6, p. 21-39) observes that a distinctive characteristic of human learning, as opposed to animal, consists in understanding principles and in consequent learning by a minimum of successful experience.

II. Present Problem Stated

The matter of seizing and applying a principle to the solu- of a concrete situation, so important in human welfare, suggested the present problem. By a principle, here, is meant any agent or means, used repeatedly under more or less similar situations, producing similar results. The primary object of the present study was to observe the ways in which such principles are likely to be discovered and applied in solving problems. It appeared that what was needed for such a study was a series of related problems of increasing difficulty furnishing conditions susceptible of control.

III. Material

The problems for solution consisted of six cardboard puzzles, cut from cardboard 8½″ square. The puzzles formed a related series beginning with a simple one having four pieces, and ending with a sixth of fourteen pieces. See Fig. 1.



PUZZLE A
4 PIECES

PUZZLE B
5 PIECES

PUZZLE C
6 PIECES

PUZZLE D
9 PIECES

PUZZLE E
11 PIECES

PUZZLE F
14 PIECES

FIG. 1

A study of Fig. 1 shows that each succeeding puzzle after the first was more complex than the preceding, out of which it was built, as it were. The puzzles are indicated by the letters A, B, C, D, E, F respectively. The first two are described in some detail.

Puzzle A—Puzzle A is the simplest and has four pieces. First, a diagonal is drawn from the upper right hand corner to the lower left. A point is placed at 2½″ from the top and one at 6″. Then a perpendicular is drawn from these two points, upwards from the 2½″ point and downwards from the 6″ point. Each piece of the cardboard puzzles is marked on the back by the number of the puzzle to which it belongs. The subjects of course did not see the back of the puzzle. On the front each piece is numbered, but not consecutively, nor is each number facing the same way. The subject must gather no clue from these numbers to aid her in solving the puzzle. A paper copy is numbered and lettered in the same manner.

Puzzle B, Six Pieces—This is drawn exactly like puzzle A, but it has an additional line through C joining the point where the 2½″ perpendicular line crosses the upper border, to the 6″ point on the diagonal. This is also numbered inconsistently, and lettered as in the preceding puzzle when no change has been made. From the figure it may be seen that piece C has been cut through, and the parts are numbered C^1 and C^2 from right to left.

Since C, D, E and F are constructed and lettered in exactly a similar manner, further description is unnecessary. It will be apparent from the above that the subjects could be guided alone in solving any puzzle by the shape and size of its pieces. The subjects saw the puzzle pieces only while using them. At all other times they were kept in a closed envelope. The symbols of identification made possible a written record of each move in solving the puzzles.

IV. Procedure

Four subjects worked two periods a week, thirty minutes each. The puzzles were presented, one at a time, and solved by the subjects working apart. The pieces of a puzzle were placed on the table and moved about by the subject until the original square was formed. The time, measured by a stop watch, was kept from the beginning of active study of the puzzle until its solution; a record of the number and kind of moves given each piece was kept, e. g., if piece 1 is placed next to piece 3, it is shown in the record thus 1|3, the line between showing the relative positions; or if piece 4 is placed above piece 2, it is shown by the digits written thus $\frac{4}{2}$; a record was also kept of introspections and comments made by the subjects.

A. Two subjects, M. P. and D. D., worked by what may be termed the "whole method." The procedure was as follows:

As soon as puzzle A was completed once, which formed a trial, the subject proceeded to solve puzzle B and the puzzle C, and so on until puzzle F had been finished. This constituted trial one. The subject then began the second trial, starting with puzzle A, then B, then C, etc., until F is finished a second time.

This procedure was continued until the experimenter was sure that the subject had mastered the puzzle, i. e., when excess moves disappeared in the final trial and the time limit of the subject appeared to have been reached. The subject was then required to draw puzzle A from memory. If the drawing was correct, she drew B on another sheet, the first drawing being removed. If the drawing of A was a failure, the subject solved that puzzle again, and then redrew it. This procedure was continued until every puzzle was drawn correctly. If a mistake was made on any puzzle it was solved over again and redrawn. The ability to draw each puzzle in succession correctly was taken as a proof that the entire problem had been mastered. This method of requiring a drawing was adopted as soon as it was found that solving the puzzle might have been purely an accident; for if the pieces were disarranged by the experimenter, the subject was sometimes unable to solve the problem again within a reasonable time.

B. The second pair of subjects worked by the so-called "part method." In this case, each puzzle was fully learned before proceeding with the next. Puzzle A, for instance, was learned by making a series of repeated trials without interruption. After it was done correctly it was repeated until the minimum time and minimum number of false moves had been reached, the necessary number of moves being determined by the number of pieces in the puzzle. This was continued until all the puzzles had been learned. The subject then drew the whole series of puzzles in the manner explained under the whole method of learning.

The rate and accuracy in solving the problems were thus registered in four ways: (1) by the number of moves, (2) by the amount of time, (3) by general observations on the part of the observer, and (4) by the subjects' reports.

V. Results

The results are given in two parts: (1) The first part embodies a general account of how the problems were solved.

This account is obtained (a) from the records of the movements made while solving the puzzles, (b) from the subjects' reports, and (c) from the final drawings of the puzzles. (2) The second part compares the relative success of the subjects using the "whole method" with that of subjects using the "part."

1. At first the trial and success method prevailed, lasting longer with some subjects than with others. It would persist until the positions of some of the pieces used in preceding puzzles were recognized, or until a general understanding of the composition of the puzzle was obtained. Thus it was observed that certain pieces were put together that were recognized and were used as a means of finding the position of other pieces. The first recognized piece in the simpler puzzle was the largest piece. When the puzzles became more complicated, beginning with puzzle D, it was the tiny corner triangle B and its neighbor which were almost invariably fitted together first. If a large piece was recognized before its duplicate in succeeding puzzles had been sectioned, the probability of recognizing the component pieces as the large piece was greatly increased. The recognition and use of the diagonal line (cut) or other through lines (cuts) increased purposeful use of pieces and encouraged a search for base lines on which the square could be reconstructed.

As to the general understanding of the plan on which the puzzles were made, i. e., that each puzzle was formed from the preceding one, the subjects varied considerably in the time required to comprehend that fact, as appears in the individual records given further on.

For the most part the subjects followed the same general plan, beginning at the left hand side with the largest piece and building towards the upper right hand corner. When the small triangle C^{22} appeared in puzzle D, some used it as the key piece and formed the puzzles from it; others recognized it at once, and fitting it to its neighbors, D^{22} and D^{12}, formed a rectangle, which they put to one side until the puzzle was completed, then placed it along the bottom of the square. Should the manner of solving a preceding puzzle be seen to apply to a subsequent one, it was apt to get attention and to become somewhat elaborated as the solving progressed. Building by rectangles is an example. Puzzle D (see Fig. 1) gave the cue to look for rectangles in puzzle E, while the construction of this puzzle reinforced the plan and idea to be applied to puzzle F, composed of four such rectangles. Or again the through vertical cut in puzzle C became the major principle on which the subsequent puzzles were done.

Fig. 2 shows that piece B was the only one in the set that did

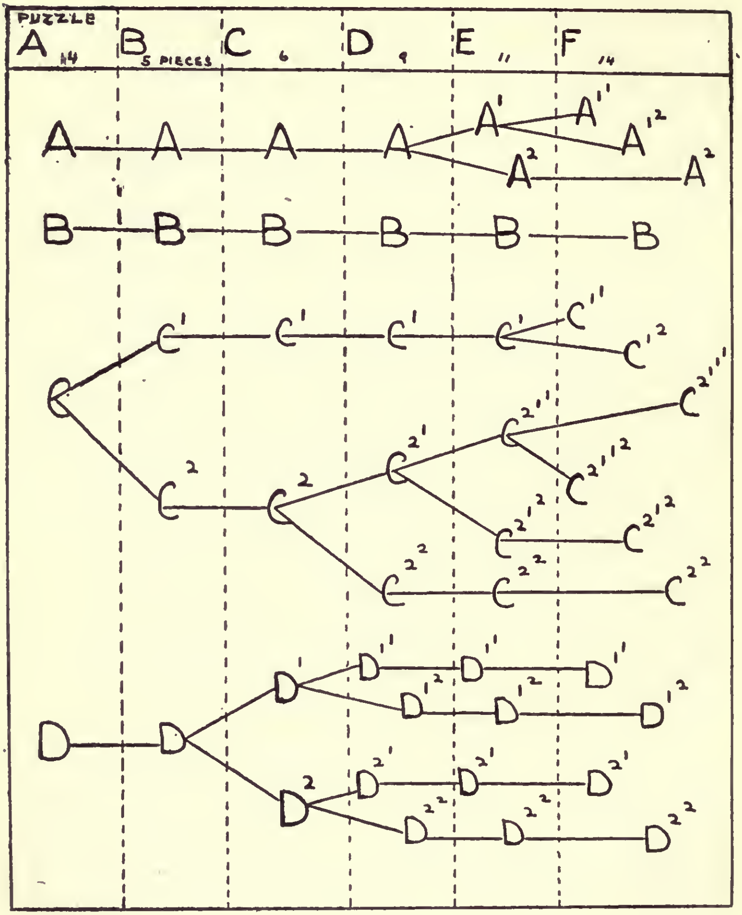


FIG. 2

not undergo change, retaining its shape throughout. But, contrary to expectation, it was in most cases the last piece to be put in place. This was probably due to two facts: (1) that the general tendency was to solve the puzzle by beginning at the lower left, and as the B piece was the last piece in the right hand corner, it remained unfitted until the end; (2) its triangular shape led to its confusion with several other pieces similar in shape.

A partial report of the methods and plans of each individual follows:

The results of two of the subjects, D. D. using the "whole method" and R. B. using the "part method," are shown in Tables I and II respectively. They show the name of the puzzle, number of the trial, manner of response, number of moves and the time for solving each puzzle. Symbols for pieces of puzzles are shown in brackets, thus, (C^2).

The rate at which the puzzles were learned is shown in some measure by the diminution in time required to solve them at subsequent trials, and the accuracy is partly shown by the number of moves. Thus in Table I it is seen that puzzle A was solved at the first trial in 8 moves and in 2 minutes, 34 seconds, and at the second trial 4 moves and 1 minute and 2 seconds of time.

The diagonal "cut" was the first feature to attract D. D.'s attention, and in the majority of cases she formed the puzzle pieces *along the diagonal*, rather than by fitting them to each other. The subject never reported, nor did it appear that she realized, that each puzzle was built from the preceding one. She attacked each one more as an independent puzzle, remembering only the times she had made that particular one, rather than using the experience gained by making all the others. That for her the puzzles did not constitute a related series further appears from her manner of drawing them. The lines which ran completely through the puzzles were noticed and remarked upon, while the two original shorter lines in puzzle A were unnoticed and as a consequence gave trouble. In reproducing the puzzles, she drew the diagonal, then the vertical and then the horizontals, followed by the two short original lines in A. The horizontal lines created confusion in drawing D, E and F, e. g., in drawing D the extra horizontal line in E was substituted for the two original short lines. D. D. omitted these same short lines in her drawing of puzzle F. The manner in which this subject both solved and drew the puzzles showed that they were conceived, solved and remembered as separate and distinct problems.

M. P., also using the "whole method," soon used the features of previous puzzles to solve those following, the major diagonal being the first distinctive feature to be recognized and used. By the third trial she explained how the extra lines cut up the pieces of preceding puzzles.

Both D. D. and M. P. solved A in haphazard fashion, but the latter in the first trial with B hit upon the plan of beginning with the largest piece, C^2 on the left, then placing in turn pieces D, A, C^1 and B, i. e., building towards the upper right hand corner. These two principles: (1) using the largest piece in proper position as an orienting function, (2) building from lower left to upper right along the diagonal as a means of control, gave M. P. immediate mastery of the first three puzzles. The problem changes in puzzle D, owing to the horizontal line (cut) forming three small pieces along the base. After M. P. had used these pieces in an erratic fashion at first, she grasped the significance of this principle, and the remainder of the puzzles were more quickly solved.

M. P.'s manner of drawing the puzzles showed that they had been grasped as a related series, for each puzzle was drawn as that preceding and completed by adding the *extra line*. A and C were each drawn incorrectly at the first trial, due to confusing a minor short line with a somewhat similar one in a later puzzle.

M. P. required 320 moves and devoted 1 hour, 28 minutes and 46 seconds to master the six problems as contrasted with D. D.'s 307 moves, 1 hour, 18 minutes and 20 seconds in the same work. The advantage of the latter subject was won despite the fact that she did not appear to conceive the problems as related and to profit by solving preceding ones, but applied to each case a common principle. D. D.'s excess moves in the final trials were 12, and M. P.'s were 8. The tabulated results of M. P. do not appear in this paper as they were somewhat similar to D. D's.

Table I. Whole Method

Subject—D. D.

Puzzle	*No. of Trials*	*Subject's Response*	*No. of Moves*	*Time Min.*	*Time Sec.*
A	1	Haphazard trials till complete	8	2	34
B	1	Begins with largest (C^2) and ends in upper R. corner	5		51
C	1	Same plan—begins with larger piece and ends in upper R. corner	9	2	37
D	1	Same plan, adds 3 new pieces at base	20	8	17
E	1	Same plan, adds 3 new pieces at base	47	16	11
F	1	Same plan, adds 3 new pieces at base	31	14	12
A	2d trial	No definite plan	4	1	2
B	2	No definite plan, places A's point to center	5		43
C	2	Begins (C^2)	9	1	20
D	2	Same as B, second trial	9	1	14
E	2	No definite plan, adds 3 new at finish	19	6	14
F	2	Forms rectangles, adds 3 new at finish	23	6	21
A	3d trial	Makes the diagonal by CB	6		48
B	3	Same as B, 1st trial; forms diagonal	5		20
C	3	Same as C, 1st trial; forms diagonal	7		53
D	3	Same as D, 1st trial; forms diagonal	11		47

Puzzle	No. of Trials	Subject's Response	No. of Moves	Time Min.	Sec.
E	3	Same as E, 1st trial; forms diagonal . .	17	4	31
F	3	Same as F, 1st trial; forms diagonal. . .	17	2	21
A	4th trial	Same as B, 1st trial.	3		13
B	4	Same as B, 1st trial.	4		12
C	4	No definite plan at first, then forms diagonal.	9	1	7
D	4	Same as D before.	9		49
E	4	Same as E before.	14	1	48
F	4	Same as F before.	16	2	55
24 (Total).			307	1 hr. 18	20

This table is to be read as follows:

While making puzzle A during the first trial, the subject responded by making haphazard trials until the puzzle was complete. The number of moves was 8 and the time 2 minutes and 34 seconds. Subject begins puzzle B with the largest piece C and ends in upper right hand corner, etc.

TABLE II. PART METHOD OF PROBLEM SOLVING

Subject—R. B.

Puzzle	No. of Trials	Subject's Response	No. of Moves	Time Min.	Sec.
A	1st trial	Tried each piece.	29	9	19
A	2d trial	Picked up C, placed B, next made ½ square	5	1	13
A	3d trial	Same as second trial	3		18
B	1	Many attempts	24	7	15
B	2	Same as A's second trial.	4		25
C	1	Same as A's second trial.	33	12	14
C	2	Placed D in lower L., built from it. . . .	5		55
D	1	Fitted C^{22} to C^{21} and built along diagonal	13	4	50
D	2	Same as 1st trial	8		54
E	1	Same as D, 1st trial	14	4	45
E	2	Same as D, 1st trial	*11	1	01
F	1	Same as D, 1st trial	21	2	23
F	2	Same as D, 1st trial	*14	1	06
13 (Total).			156	46	38

Read as Table I.

R. B., using the "part method," understood the basis upon which the puzzles had been built as soon as three, A, B, C, had been completed. At first one-half of the puzzle on the left of the diagonal was formed; then the right half was made to complete the whole. Piece C^{22} became the basis for building puzzles D, E and F. R. B. saw and often referred to the four original pieces of puzzle A. It should be observed that the total number of moves was 156 and the time 36 minutes and 48 seconds and the total number of trials 13.

---

*The comparatively large number of moves in the second trial of E and F respectively was due to the greater number of pieces belonging to these puzzles.

Subject E. D. applied the knowledge gained in solving the simpler puzzles to the complex ones. She, too, saw that each puzzle depended in construction upon the preceding one. Her tendency was to begin on the left with the largest piece and end in the upper right corner with piece B. The significance of C^{22} was not seen at the first trial with puzzle D, but became evident in the second and was at once used as the starting point for forming the rectangular base. It was similarly used in puzzles E and F, and became the cue for finding their superimposed rectangles. E. D. completed the entire six problems in 137 moves and in 29 minutes and 46 seconds. This was the best record of the group. The table containing her results is not given in this paper.

It was quite evident, even before the subjects reproduced the puzzles in drawing, that the "part method" was far superior to the "whole."

2. This decided difference in the comparative worth of the two methods calls for further analysis and comparison of results, and particularly since earlier investigations showed a strong superiority of the whole over the part method of learning. These early investigations by Lottie Steffins quoted by Colvin (2) and much later by Pyle and Snyder (8, p. 343), were concerned with methods for learning prose and poetry, involving strictly language habits. But whenever problems are set in which motor habits, so called, rather than language are involved, as in Pechstein's (8, p. 344) work, the results reverse the earlier findings, showing a superiority of the part method. In a recent article entitled "Smaller vs. Larger Units in Learning the Maze," J. W. Barton (1) shows that there is ample evidence to justify the doubt that has been raised concerning the validity of the statement that to "learn by wholes rather than by parts is more efficient." Hunter claims that "as yet insufficient experimentation has been done to warrant the extension of the law to other than language habits."

While the six problems used in the present investigation required movements in their solutions, they are more easily classed with "reasoning material." The conditions did not force rhythmic, precise and constant movements, but called for sharp spatial discrimination, a search for cues and for repetition of significant features, perception of a general feature, of the connection of the several parts and their places in the solution of the whole. Tables III, IV and V express in numerical terms the superiority of the part over the whole method.

Table III is made by combining (not averaging) the numerical results of the two subjects using the whole method. Table IV is similarly constructed from results of the part method.

In the column headed "Total Trials" is shown the number necessary for the completion of each puzzle before it was solved. The time per trial, however, shows wide variations, the longest being required for the more complex puzzles.

TABLE III. RESULTS OF WHOLE METHOD OF LEARNING

(Combined Results of Subjects M. P. and D. D.)

Puzzle	*Total Trials*	*Total Time* *Min.*	*Sec.*	*Total Moves*	*Excess Moves in Final Trial*
A	8	8	31	37	0
B	8	6	41	37	0
C	8	16	15	80	6
D	8	34	22	125	3
E	8	52	39	177	6
F	8	48	38	173	5
Totals	48	2 hr. 47	6	629	20

TABLE IV. RESULTS OF PART METHOD OF LEARNING

(Combined Results of Subjects R. B. and E. D.)

Puzzle	*Total Trials*	*Total Time* *Min.*	*Sec.*	*Total Moves*	*Excess Moves in Final Trial*
A	5	12	29	28	0
B	4	12	47	48	0
C	4	23	15	61	1
D	4	11	49	46	0
E	4	7	69	49	2
F	4	5	26	69	2
Totals	25	1 hr. 13	55	301	5

By a trial is meant a period devoted to solving a problem once.

TABLE V. COMPARISON OF FOUR FACTORS OF THE TWO METHODS OF SOLVING PROBLEMS

Name of Factor	*Whole Method*	*Part Method*
Number of trials	48	25
Total time	2 hr. 47 min. 6 sec.	1 hr. 13 min. 55 sec.
Total moves	629	301
Excess moves in final trials	20	5

The "excess moves in the final trial" shows the degree of accuracy and thoroughness with which the puzzle was learned—zero indicates (Tables III and IV) complete accuracy of achievement. For if a puzzle could be completed, e. g., in five moves, and the subject took seven moves—two would be the number of excess moves in the final trial—the puzzle was not presented to the subject again.

If the two modes for solving the problems be checked and compared by these four criteria: (1) number of trials, (2) time involved, (3) number of moves actually made, (4) number of excess moves, the evidence is decidedly and convincingly in favor of the part method. There was no way to determine the amount of over learning in either method, but in the writer's judgment it was negligible in both cases.

VI. SUMMARY

A. Facts relating to the subjects' responses while solving and learning the problems:

1. Trial and error responses were gradually superseded by those of control and purpose when the function of a piece in the puzzle was recognized, or when some factor by reason of its contributing to the solution attracted attention and forced recognition, e. g., a large piece in a simple puzzle or a very small piece in one more complex.
2. Attention, recognition, efforts of control and of purpose grew more prominent and effective with the formulation of a plan that embraced all or nearly all of the problems, e. g., building the puzzle along and from the diagonal, or upon the rectangular base in complex problems.
3. The knowledge gained in solving one puzzle was applied to the solution of the next, provided that similarity of parts and of plan were recognized. This was what usually happened.
4. The puzzles were built without exception and regardless of plan from left to right.

B. Facts concerning the whole and part methods:

1. With but few exceptions the whole method required four trials and the part method two trials to learn each puzzle. (Solving in this report is a function of learning. Several solutions were necessary before the problem was learned.)
2. The time spent in solving and learning was more than twice as long by the whole method as by the part. (Over learning was not apparent in either case.)
3. The number of moves made to solve a puzzle was on the average more than twice as many, and the inaccuracy in the final trial was four times as great in the whole method, as in the part.
4. Interest was better sustained throughout in the part than in the whole method.

VII. DISCUSSION

1. Haphazard methods gave way to consciously derived and rational ones, which were in turn improved, or superseded

by still better plans formed by conscious and deliberate intent. This agrees with Ruger (6, p. 49), who says, "The results of the practise series with the puzzles seem to show, however, that with such material the method of conscious control is the efficient one" for problem solving. There were, of course, chance moves that brought good luck and got attention by reason of that fact, in the complex puzzles, but more often original moves guided by an idea due to critical observation of the pieces was the method.

2. The formulation of plans and principles appeared to rest, so far as objective data were concerned, upon the more obvious features of the puzzle pieces, such as position, size, shape, direction of line (cut edge), the relation between pieces, their common or different connections to still other pieces and to the whole, and, so far as the subjects' responses were involved, upon grouping, relating and organizing the several meanings as apprehended in and extended to the puzzle pieces. Dewey (3, p. 131) in discussing the extension function of meaning says that "objects would be as isolated and independent intellectually as they seem to be spatially, were they not bound into groups or classes on the basis of characteristic meanings which they constantly suggest and exemplify."

3. The superiority of the part method over the whole places in bold relief certain factors and conditions that lead to the apprehension of meanings, to their organization and coalescing into principles used in solving problems. This advantage of the part method in the present investigation doubtless depends upon: (1) The immediate repetition of solving the problem. This corresponds to the excellent principle of *recitation* used in memorizing. (2) The part method kept the complex and difficult problems in abeyance until the simpler ones had been mastered, and in this way graduated the difficulties to the learner's capacity and rate of learning. (3) The part method obviated the tendency to retroactive inhibitions that operated more or less in the whole method.

4. Building the puzzles invariably from left to right is merely another instance of the functioning of habit in the interest of reasoning (7, p. 33).

BIBLIOGRAPHY

1. Barton, J. W. "Smaller vs. Larger Units in Learning the Maze." *Journal of Experimental Psychology*, Vol. V, December, 1922.
2. Colvin, S. S. "The Learning Process." 1913.
3. Dewey, John. "How We Think." 1909.
4. Hunter, J. W. "General Psychology." 1920.

5. Lindley, E. H. "A Study of Puzzles," *American Journal of Psychology*, Vol VIII, 1897.
6. Ruger, H. A. "The Psychology of Efficiency," *Archives of Psychology*, June, 1910.
7. Thorndike, E. L. "The Effect of Changed Data upon Reasoning," *Journal of Experimental Psychology*, February, 1922.
8. Woodworth, R. S. "Psychology: A Study of Mental Life." 1921.

REPETITION VS. OTHER FACTORS IN LEARNING

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If general practice is to be taken as a correct indicator, it would seem that the most important factor conditioning learning is that of repetition, or exercise. It makes little difference what the subject is, the procedure most consciously attempted in teaching is that of *drill*, or the putting of the child through some exercise or other. This is done with the feeling that, by so doing, the members concerned perform the act previously used more perfectly on succeeding occasions.

In many cases this subsequent relative ease of performance is found to be a fact. Just what is responsible for this change, however, should be more seriously considered and better understood. To do so, is likely to discover that other factors function in even greater degrees than is thought to be the case for repetition. To know the factors or the factor most instrumental in bringing this change about is to have gone a long way in attaining the best results in teaching. The failure in attaining adequate results in many instances of mere repetition has become proverbial. There are few teachers who have not heard the story of the pupil who was kept after school to write the expression, "I have gone," an excessive number of times, only to find that in a real situation of life, involving this idea, a return to, "I have went," was had.

Some will argue that he did not repeat the correct form a sufficient number of times, else the correct response would have been securely fixed. Such cases of failure, in spite of the long and frequent use of mere exercise factors, are numerous. If it were not for just these exceptional cases the argument for more and more exercise would have more weight.

Look, for a moment, at another aspect of the matter. Every teacher has experienced many cases of near perfection in adjustment under the conditions of a single response, or situation of experience. If numerous repetitions are necessary in making meaningful new situations presented, what is the explanation for such cases? Again, such experiences seem to be the most lasting in memory. This is likely due to the factor of crucialness, or need at the time in making for life's adjustment. Who has not had some such experience as being told but once to avoid the danger of some definitely defined source of disease and made the adequate adjustment when such threatening situations presented themselves, or has always remembered and avoided a bad place in a road which caused the breaking of some part of the automobile necessary in travel?

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[1] The writer does not submit this article with the feeling that what is here presented is final or in any way an ultimate explanation of learning. He recognizes that as we come to know more about the physical and biological sciences we are going to get a more and more complete statement of what is necessary for the most effective teaching. But some of the ideas here expressed might indicate, to those whose function it is to arrange stimuli-response situations, that possibly the story of just how learning takes place has not been completely told, and that there is yet much to be done in this field.

It seems very plain that repetition is inadequate as an explanation for much of what is learned as well as for failing to produce results, in some cases at least, even when it is used with great lavishness. Then we must look to other factors, as well, for an explanation of what is necessary for the best results in teaching, if we care to control all the factors that seem to be adequate in producing the necessary changes in adjustment.

It does not take an expert to see that teaching, as we have it now, presents very little other than the exercise factor as a means of bringing the desired change. Likely there is validity in the statement, "We learn to do by doing"; but let us express the matter in another way and take a look at it. "We do because we have learned." In other words the performance is only an indicator of what has taken place in the equipment, involved in the response, and not necessarily the factor making the change. Learning is change, and what is changed is likely some aspect of the response machinery. Just how the mere fact of use gets ahead of the necessary change in the mechanism is hard to see. It is somewhat like crossing a bridge before it exists. The crossing might be evidence of the bridge, but I doubt that the act of crossing had anything to do with the existence of the structure. There is complete agreement on the point that some kind of change is had, but there seem wide differences as to the nature and the causes of these changes produced. Exercise might be necessary in making more "permeable" the nerve pathways necessary for the proper response; but some other factor must be operative in such cases of immediate learning as are indicated above, and this is in greater amount than is commonly thought. From most any angle that one looks at the problem it seems that the change induced, if it is to remain, is one to be defined in terms of a particular relation between what is newly presented and what is had already (memory).

It seems that whenever a new impulse is had it more or less fuses throughout the system, rather than takes on a well-defined path. This would seem to imply that all the possibilities of direction in pathway responses are open and that the matter of learning is that of selecting the correct pathway out of the many, and making it more permenent. This permanency might be accounted for on the basis of repetition, if it were not for the many cases of apparent exceptions to such a conclusion. Is it possible that this memory factor might be defined in terms of the *degree of fitness* that obtains between the already organized scheme (nature and nurture factors) and the new impulse set up by the new situation presented? This fitness might be even more fundamental and deep seated than is the case for mere neural bond relations. It might involve the *electron arrangements, or even more fundamental or elemental factors*, required in material identity, for it should be remembered that nitrogen valence changes are had in the different pathways required in the responses of a frog, which means that electron changes are involved in such phenomena. If this is the case, then it is likely *what is done to this organized system*, and not *what is done by it*, that produces the readjustment, or change, called learning.

The two other factors responsible for learning that have been presented, particularly by E. L. Thorndike, are readiness and results. These two have been given very little place in the actual procedure in teaching. They are recognized as necessary factors by most teachers when theorizing on the subject of learning, but in actual practice, repetition, or exercise, is given by far the most prominent place.

By readiness is meant the set for neural response motion. This shows itself in degrees, and the intensity with which it shows itself on different occasions, and the direction of its projection, determine what is taken in. This seems to be the selective element of one's nature. Surely, this fitness is accompanied with pleasure, but does this feeling aspect "stamp it in" or is it held simply because of its relation to what is already had? Since the fitness is likely never absolute, but relative, it is not hard to understand the case of the pupil kept in after school indicated above. The reason he did not retain what he had been forced to exercise on was that it was only in a very slight way related to his nature. In other words, it was not vital in his life's processes as far as his accumulated response equipment was concerned. For the case of avoiding the disease (above) the matter presented was vital, or it fitted more completely into his native and acquired nature, thus making it impossible to do otherwise than to be retained.

We hear very much about the readiness factor in terms of interest, purpose, ideals, etc.; but for the most part, in teaching, it takes very little definite form in the understanding of the inherited and acquired nature of the particular pupils concerned, in their relation to the new work presented. To particularize on this point is to speak of the previous preparation—field work, supplementary study, assignment, question or any stimuli previously presented. In other words, it seems to be what is done to the organism that determines its selective direction (readiness) of the future.

When matters are presented in such a way as to conform most closely to the kind (for any given time) of nature possessed by the pupil, there is no question as to the operation of the selective and memory factors. In such cases we say, "They are intensely interesting," which means in practice that the first presentation (if it is made complete) is all that is necessary to produce the change called learning. The simple fact is that it *fits*.

This *fitness*, which seems so essential to adequate learning, is what is meant by effects. Because of its *fitness* it is held. Then it is very important to let the pupil know in definite terms and at the time of stimulation, or as near that time as possible, the results of his attempted responses in making adjustment. This can likely best be done by means of taking objective measures of his exercise results. This makes the situation possible of verification, which means that the entire motive (organized being, or readiness) has been accomplished only to be again projected for further adjustment.

Exercise, while necessary, is so, largely because of its function in indicating what has been done to the organism by way of change in organization for adjustment. This change has been affected by what *has been done to the organism*—impingement upon receptor ends producing organic and mechanical changes necessary to the response produced and not by the acts themselves.

The factors, then, of most concern to the teacher, if the best results are to be had in the producing and directing of change (learning) are, first, readiness (native and acquired nature); second, such stimulation as is in keeping with this nature, or can be taken in by it; third, a knowledge of results, which can be had only by means of definitely and objectively checking the responses had. To "repeat" these responses (which in a technical sense is likely never done) is to provide only another measure of what has gone on in the organism during the interim since the last checking.

It is likely true that much means and energy can be saved, to us all, if the lion's share of the "humdrum" of drill and repetition now in common use, not only in our schools but in all other walks of life as well, be supplanted by a more serious understanding of the relation between what is presented for purposes of stimulation and what the creature is by nature (native and acquired); i. e., do those things most conducive to shaping the factors of readiness, provide the stimuli that are most fitting, and have the being respond for only a sufficient number of times to adequately test the fitness in organization for adequate adjustment.

INFANTS' INHIBITION: A GENETIC STUDY

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The writer kept notes on obvious inhibitions of his two infants from birth until they were several years of age. Some of these notes are presented below. In recording them the interest of the writer was not only in cessation of activity but the cause of such cessation. Does inhibition merely mean arrest of activity or a shifting of neural discharge? What relation has inhibition to attention? What is its significance in control of conduct?

Notes

Day 1. B ceased crying immediately after birth when I pressed my palm softly over the top of her head. This repeated several times with like results. However, a mere finger touch on the head provoked cries. J during the first day ceased crying when face was softly touched or hips patted. Dearborn noted like reactions to touch sensations the first day. Pfluger reports "a brainless new born child" that, when screaming violently, could easily be quitted by letting him suck his finger. Peterson noted a case that stopped crying three times in succession, to the sound of a rattle, on the sixth hour.

Day 2. J ceased crying when I whistled. B, three times at unusual sounds.

Day 7. B stopped nursing when I made a variety of sounds.

Day 8. J would stop crying when piano started to play, and begin crying at once when it ceased to play—this for seven successive times. Likewise B ceased crying when she heard a new sound; but not always at the same sound repeated.

Day 25. B will stop crying when the door of her room is opened.

Day 27. J ceased crying when I entered the room where he had been alone. Although he ceased crying on hearing the piano he failed so to respond after a few times.

Day 30. J not only will cease to cry but will fall to sleep when I sing to him.

Day 48. J ceased nursing as I looked at him with head and facial gestures.

Day 64. After he had cried for almost half an hour, he ceased when mother merely spoke to him. While nursing he stopped very suddenly and turned his head, looking into his mother's eyes, without her first making any facial gestures or any sounds.

Day 77. B will immediately stop nursing to look toward newly turned-on light.

Day 96. Stopped nursing suddenly and turned about toward the window when the tower bell above him rang, maintaining that position until the ringing ceased. He would do this invariably up to the 120th day. Likewise he stopped nursing to watch with wide-open eyes his aunt break macaroni into a pan.

Day 146. Fixed attention by J is accompanied by perfect stillness. Noted in B also about the same time.

Day 158. J, who had merely clawed one's face when his hands touched it, is now beginning to feel softly over it.

Day 174. Perfect stillness as one holds a watch to his ear. Fixed attention always means immediate arrest of movements.

Day 177. When J started to nurse I yelled about 6 feet away, and he turned and smiled at me. As I spoke and gestured he continued in same position, and with mouth opened as it was at the time I yelled.

Day 180. Always stops play or any activity and remains motionless while the tower bell rings.

Day 182. For the first time he was found wholly relaxed while lying comfortably on the floor, cooing. For some days his legs while sleeping were perfectly relaxed.

Day 203. Will lie on the bed perfectly relaxed. This is a very decided development.

Day 227. J voluntarily lay down in his carriage for several minutes at a time.

Day 234. While B was sucking her thumb her mother called sharply to B: "Take that thumb out of your mouth." She withdrew it as of obedience. Later a like reaction was elicited. She did not obey as an adult would, but merely relaxed suddenly, whereby the thumb mechanically withdrew.

Day 247. J very suddenly paused, and looked around toward the door, in the midst of play, when he heard a familiar sound. Likewise his activity at any time will cease suddenly, to let him turn to watch a hissing steam pipe or running faucet. In all cases, where he does not reach for a substitute object, he relaxes grasp very slowly; when reaching, however, the relaxation is very quick and easy.

Day 281. Had reached over the edge of the carriage about to drop a pan lid, when I called sternly. Then he put the pan lid back into the carriage. Again this is mere inhibition and not "obedience." Again, when about to pull off a bureau cover with contents, I called to him and he released grasp as if shot and turned and looked "pitifully" at me.

Day 287. When twenty of his familiar blocks where placed on his high-chair tray in front of him, he threw ninteen of them to the floor in 20 seconds. After starting to throw the last one he withdrew it, chewed on it for 40 seconds before he threw it. When this experiment was repeated he kept the last one in like manner for 68 seconds. On third trial, 20 seconds; fourth trial, 7 seconds.

Day 288. Twentieth block in experiment kept 110 seconds; in next performance last block was kept 5 seconds; third performance, dropped as quickly as the other nineteen; but the third block had been held 36 seconds.

Day 298. Frequently after starting to do something, as throwing a toy, will stop suddenly, with no apparent reason. Will cease any activity to seize a speck of dirt on the floor.

Day 307. About to insert a bunch of carnations into his mouth, I shouted to him, when he dropped the flowers to the floor. B ceased all play movements on two occasions when music started in the house above us. Each time, after a few seconds, she resumed her play.

Day 313. While I was building blocks for him to knock down he would hold his hands upraised while I said, "Wait now."

Day 315. While J was with G, I reached out hands to take him; as usual, he extended his; then he withdrew quickly and turned about to seize G by the neck. He repeated this several times in succession. His hands having been slapped for seizing a book, he would frequently look toward it, extend hands about to take it, look toward his mother, who said: "No, sir"; he finally turned away without touching them.

Day 318. Sometimes he will drop his toys as if paralyzed, to clap his hands in response to request, or on seeing a drink of water or morsel of toast approaching him.

Day 321. For several minutes he looked at pictures in a magazine which his mother showed him, making no attempt to seize, tear or crumple the paper. This is a very decided development of a few days. Paused in midst of play to listen, motionlessly, to striking of tower clock; at another time to the starting of a lawn mower.

Day 324. Ceased eating immediately to listen to a band play, a block away. When about to seize some object will drop hands immediately when one calls "No." Often reaches for the spectacles on my face but checks his grasp without a word or gesture from me.

Day 327. Feels gently over one's face with index finger only. He has learned not to touch my books or papers anywhere they may be found.

Day 339. A calmness never before noted as he sat in trolley, where he moved eyes and head instead of jumping about.

Day 358. While creeping he turned about like a flash and returned to an object he had left. Has done this several times lately. Maybe he suddenly remembers something he has seen. Very frequently checks himself when about to do something heretofore forbidden. When carried out is perfectly still and does not jump about. When fed or given a drink, no longer seizes the cup or spoon, although he has never been forbidden to seize them. He was "motionless" for about *ten minutes* as he watched for the first time a gasoline engine running.

Day 361. Does not throw dolls around as roughly as other toys. For several months, when a morsel as of bread is given him, which he does not want, he lays it down carefully, but does not throw it down. While playing with different blocks and toys, he stops occasionally to examine certain ones.

Day 363. Whereas he generally has tossed about, at random, and has tried to look at things or reach them, when being diapered, he is now beginning to lie almost without motion. Lately, too, he has been quite inactive after a nap. Sat on his mother's knee today for eight minutes, perfectly relaxed. When angry he by no means tries to walk but sits down and howls.

Day 365. In the midst of play, at times, will stretch out lax on the floor, on his back, sides or belly; sometimes manipulates small objects in that relaxed position.

Day 369. When on several times he started off to walk across the floor to a person opposite him, he turned about before making the final dash. Though he rarely cries when hands are slapped for taking things, he never again takes things for which hands have been slapped.

Day 375. In the midst of play he turned toward the door in a quiet attitude when he heard a crow caw. He later did the same.

Day 379. Things which he wants or already has he will give up without crying if one makes a great ado about them.

Day 391. Periods of relaxation longer and more frequent. He lay still on the couch while I counted 40.

Day 438. Lies on the floor motionless several minutes at a time.

Day 416. He always watches a thrown object till it comes to rest. Often then the throwing hand is sustained in the final throwing position while he watches.

Day 450. Has never broken anything with a ball. Has learned to throw low. As a result of but little punishment he does not scar furniture. Readily learns what he can or cannot do or have. Started for a dish of food several feet away; walked fast as if going for something, then after a few steps turned about and looked for something on the floor. Again he started, and once more looked about, when he finally hurried to the food.

Day 460. On passing the refrigerator from which he was accustomed to get graham crackers, he suddenly dropped a toy and begged for the cracker. Beginning to lean against things, as couch, restfully, in a standing position.

Day 464. When his mother called, "Baby John can't find his mother," he ran to find her, carrying a block in his hand. About half way he dropped it, but ran about three feet, then turned about, seized the block and returned to his play, apparently forgetting his mother.

Day 471. Having raised his hand to strike a chair with a toy, he first looked at me, holding his hand for striking, then without a conscious gesture or a word from me he slowly lowered the block.

Day 473. Instead of knocking down his box-blocks, my "No, no" led him to pick them off the pile one at a time. Given a bit of zwieback when he had a cracker, he seized the zwieback with the empty hand and with the other, stooped and carefully laid the cracker on the floor. What he does not care for he will throw with force. This also noted in B at about the same age.

Day 477. Blocks built so high that they will scarcely stand he will take down one by one, without upsetting them.

Day 506. Points frequently to things which have often been forbidden, with a shake of his head, meaning, "I dare not have it." He is very cautious as he walks about his high towers of builded blocks, lest he knock them down.

Day 525. Having found two egg shells in which he showed keen interest he was told to throw them into the garbage pail because they "were dirty." He hesitated, then instead of throwing them he very softly laid them into the pail.

Day 525. Running for another toy of a group which he was transferring from one side of the room to another, he stopped suddenly, about half way, and turned back, manipulated the block last carried, then ran after the next one.

Day 533. Will stop crying when injured, if one says: "Where is Fido or where is Kitty," or if these are shown him.

Day 553. When with uplifted arm he was about to throw a ball, he ran to the kitchen, got his broom and asked me to bat the ball with the broom.

Day 573. If on waking at night he begs for something or to be taken up, can be quieted if one talks of certain persons he is interested in or of certain animals. The same was noted for B.

Day 594. With no suggestions from any one, after throwing a ball to G several times he inhibited uplifted hand and did not throw.

Day 755. While playing, will often drop toys abruptly, without suggestion from any one, and run for a drink of water. About to do something he will at times very suddenly change. Sometimes in response to a question of choice may answer, very slowly, then may change from one answer to another.

Day 872. Having been reprimanded for eating a piece of ground raw meat, when I was out of sight he seized a second bit but without anyone's suggestion he threw back the meat.

In the instances above, it appears that cessation of any kind of activity implies a shifting of the direction of neural discharge, the "supplanting of one sort of activity by another."[1]

Applied to Control of Conduct

Our whole governmental machinery—legislative, executive and judicial—is employed chiefly in attempting to prevent members of society from doing what organized society considers to be wrong. On the other hand, upon the several educational agencies seems to rest the responsibility of helping lead all members of society to do what the leaders of society consider to be desirable conduct. But, unfortunately, much of the home education, as well as that of the church and school, has been occupied in an attempt to prevent certain modes of conduct. How many are the parents and teachers whose "Don't do that" is rarely in evidence? It seems perfectly natural for any one who assumes responsibility for controlling the conduct of others to take for granted that he should merely *prevent* certain activities without any concern about the kind of activity that ought to be substituted so long as what he counts reprehensible shall not be repeated.

If we are going to get anywhere in the building up of character, we must set out with an interest in the positive, desirable activities, so that at the critical moments, when the child is about to do the undesirable, or is doing it, we can lead him to do, instead, what he ought to do.

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[1] "The Psychology of Child Development," Chap. IX.

Contrary to this seemingly ideal mode of attempting to control conduct is the traditional fear appeal. Whereas by such an appeal we can temporarily deter him from a given activity that same fear appeal may likewise deter him from the very kind of activity which at the time is most desirable. Fear stimulus, moreover, seems to check any activity which has not become pretty highly mechanized, by supplanting that activity by another which is more highly mechanized. With fear appeal, there seems to be a damming up of neural energy which later bursts forth along the paths of the least resistance. In terms of conduct, there is no assurance that the bursting forth will be in the right direction. Indeed it seems most often to be in the wrong direction. Furthermore, there is nothing in the fear appeal that elicits the co-operation of the individual whose conduct we attempt to control. Usually there is little or no choosing—the supplanting activities do the choosing for themselves; it is a matter of the most nearly related reflexes.

In terms of attention of the actor, cessation of any activity implies a shifting of attention toward another activity *per se*, or toward the real or symbolized end of that activity. In attempting to prevent a given activity by a fear appeal, the attention usually is scattered, with the fear stimulus claiming it in part, or with the attention on the factors relative to the activity to be prevented, or on numerous other possible factors, depending on the reflexes most called into activity by such an appeal. If, on the other hand, there is offered the appropriate suggestion toward an activity which the suggestor is certain will command the attention of the actor, and which he, on his own account, will choose to do, the immediate cessation of the undesirable activity in question is inevitable.

In the long run, every one does only what he wants to do; therefore, whether to check a certain kind of conduct or to develop a certain kind, about all we can hope to do by way of controlling another is to lead that person to want to do what we want him to do—in other words, to make our wishes his. This is possible only in so far as we can tie up, by appropriate associations, that person's most cherished wishes with those which it is desired he shall make his own. Needless to say that the degree of success will depend upon our familiarity with that person's most impelling wishes and upon the esteem which he holds for us.[2]

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[2] Myers, Garry C., "Control of Conduct by Suggestion: An Experiment in Americanization," *Journal of Applied Psychology*, March, 1921, Vol. V, p. 26-31. "Army Lessons in English," War Department.

In conclusion, we prevent wrong conduct in a person by leading that person, with the right positive suggestions, to want to do what we consider is best for him to do. It need not be a matter of his conscious wish. All that is necessary is that what we want him to do shall become more attractive to him than what we do not want him to do. This more attractive activity may vary from the lowest form of reflex to the highest order of "conscious" activity.

The Evolution of an Infant's Walking

Writing about "gross bodily control," Thorndike in his "The Original Nature of Man," page 47, says: "It appears to the writer that the contribution from training is slight, that these accomplishments are in origin much more like breathing, winking or sucking, than like playing tennis, dancing or swimming. The case of walking is instructive. Here, although under the conditions of civilized family life, children appear to learn, or even to be taught, to walk, it has been shown that the appearance is illusory.[3] The baby's trials with varying and increasing success are not the causes of a habit, but the symptoms of a waxing instinct."

The writer offers some notes below which he began to record more than eight years ago (July 10, 1913) and which seem to indicate that for the child observed, at least, walking is a kind of gradual evolution from the first day of the child's life. Pushing against objects touching the soles of the feet, throwing out the arms when quickly lowered or raised, and the vigorous grasping reaction on the first day of the child's life, all of which parents and nurses must have observed from time immemorial, are undoubtedly among the few fundamental original reactions out of which the numerous other reflexes are conditioned and other habits are developed to make up what is called walking. (See John B. Watson, "Psychology from the Standpoint of a Behaviorist," Chap. VII. Also Garry C. Myers, "Grasping, Reaching and Handling," *American Journal of Psychology*, 1915, 26, 525-39.

NOTE—The numbers at the left of each paragraph indicate the age of the child in days. J. and B. are the assumed names of the children studied.

1. B—Gentle, uniform pressure on the soles of her feet elicited from her vigorous pushing.

2. J—Pressed very hard against nurse's knees with soles of feet, and most when angry at having head washed.

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[3] He refers to Kirkpatrick ['03], p. 79-81; Trettien ['00], p. 42; Woodworth ['03], p. 315.

3. J—Lying on belly in bath, dug his toes into the nurse's knees and pushed with feet in unison sliding his body. Then with a new "dig" he, after drawing up feet again, pushed himself several inches.

16. B—Whereas a soft touch on the soles of the feet elicits a drawing away of the feet, slight uniform pressure stimulates pushing in opposite direction. While supported by nurse's hand under her stomach, she straightened limbs against nurse's knees with her trunk rigid, throwing herself from the nurse's lap.

25. J—If soles of feet are touched by chair or anything he will push his feet in unison against it.

49. J—Can scarcely be kept in one's lap if soles of his feet touch any supporting object.

50. J—Put on his side, he will immediately roll over.

72. J—He maintained his grasp of my hand while I pulled him from reclining to sitting position, bending his body only at his hips.

87. J (from this time on)—He will pull himself to a sitting position if one keeps one's seized hand taut.

112—Can sit in one's lap without aid.

114—Can roll from back to either side.

139—Almost wriggles out of mother's arms on being dressed.

143—For several weeks when lifted from crib or from one's lap, while he is in partial upright position, he gives strong push from his feet by straightening and stiffening his limbs as he is lifted up. On attempting to lay him down, if his soles touch the bottom of the crib, he so stiffens himself immediately as to be like a log, when he must be so placed in the crib.

152—While his feet were held firm he raised from a reclining to a sitting position, then dropping forward.

153—Sat for 15 minutes in the carriage with only the support of the strap in front of him.

177—Twice rolled off blanket 30 x 30 inches, and then 26 inches beyond the blanket—all in 15 minutes.

180—On attempting to reach for toy dog he got on knees and forearms, but his hands failed to co-ordinate with his feet.

181—While on toes and hands he failed to move forward to his doll 18 inches away.

182—While on his back on floor, whirled about on shoulders as a pivot with the aid of his feet only, and by so doing moved forward about four inches.

184—While held under his arms so that his feet barely touched the floor, he makes rapid alternate movements as if dancing a jig.

192—In carriage he pulls himself to sitting position by grasping the sides of the carriage. Will not lie down when awake.

200—When taken up, he allows his legs to flex at knees by mere relaxation, then straightens them quckly, resulting in an upward spring. So times it as to occur just when one starts to lift him up, from under the arms. Heretofore when he would lose balance while in a sitting position on the floor, he would just roll over like a log, bumping his head or face. Today he threw out his hands, which protected him.

210—Can sit on the floor with no support. About half the time in his carriage he stands, even while carriage is moving on the street. Thus he stands about three minutes at a time, getting down to rest. Sometimes he releases his hands from the sides of the carriage while it is moving and is supported by the carriage strap alone. This requires considerable balance.

218—He can rock his carriage by rocking his body while in a standing or sitting position.

225—Got himself up on feet and on hands almost at arms' length, but failed to move forward.

230—Cannot yet get right co-ordination of hands and feet for creeping.

245—Feet held down by covers, he readily rises in his carriage without aid of his hands.

253—Lying across the bed he pushed himself by placing feet on the bed and then straightening legs.

292—For the first time he moved forward when put on the floor. His hands pulled as he vigorously pushed with his toes. Had been able to thus move backwards for a few weeks.

293—Creeping has developed in very pronounced form.

295—Crept all over the room.

303—In addition to creeping, he, in natural sitting posture, walked on hips.

304—Chest still drags some on the floor because his arms are weak.

305—For the first time he developed, in creeping, alternate instead of unified pulling. He creeps only when for desired objects. When in a great hurry he resorts to original creeping movements of unified pull with hands followed by a unified push with the feet.

306—Stood in carriage, holding to its front, while wheeled across a rough street.

309—For the first time he mastered alternate movements of hands and knees in creeping. If while in haste he starts to go forward he may go backward in spite of his efforts.

313—For first time put weight on toes and hands instead of knees and elbows. Always rises to sitting position after arriving at goal. Upon the appearance of an attractive object while he is in a sitting position he will spring forward to creeping position on hands and feet, very quickly.

319—Remains standing in carriage while wheeled several blocks.

320—Creeps now as an adult would.

321—Climbs up by furniture repeatedly and will stand with the support of only one hand. Walks very well when one holds him by one of his hands. Holding to the couch, he steps along it alone.

322—Sometimes creeps with feet flat on the floor.

323—Has developed a good and easy way of getting down from standing to sitting position. He holds to support as long as he can, then squats quickly but softly.

325.—Creeps with objects in one hand.

326.—When one lets him fall forward from standing position he nicely catches himself on palms. Also bends his knees quickly then.

331—Pulled himself up to the table, standing on his toes, with perfect balance.

334—Practically runs along the couch. Can rise and stand by smooth surfaces, as wall. Seized his mother's arm at full length with one hand, then the table leg with the other hand, about 18 inches away. Then released mother's arm and stepped toward table, seizing the table leg with both hands. Often stands holding himself by one hand while manipulating object with the other. Crept 100 inches in 5 seconds by the stop watch.

339—Often stands rocking empty chair, with no balancing difficulty. Will sometimes stand by furniture, release both hands, using them in manipulation of objects, apparently not aware that he has no support.

340—For the first time he rounded the corner of a box (walking). Arms fly out in perfect order as protective of him when he is falling or about to fall. Climbed up by closed door and walked along it.

345—Formerly would climb up beside chair, etc., seize the chair with one hand and, with the other, reach to the floor for desired object for manipulation. Now he has such objects in hand or hands as he rises. A number of times he stood for several minutes wholly unsupported, manipulating objects. As soon as he knows that he has no support he drops.

356—Instead of dropping quickly to a sitting position, after releasing his hands, he paused at that point an appreciable time before assuming the sitting position.

357—Took three steps alone.

356—Spends almost half of his waking hours on his feet. Walked across floor only with the support of A's hand meeting his softly, both at full length.

359—In a hurry to get something he will throw himself from a sitting to a creeping position in an instant, very quickly and easily.

360—Made three steps alone from chair to bed.

361—While eating crackers he released the hand that was supporting him, on several occasions, standing wholly alone. Highest number of steps alone—eight. Walks a great deal around furniture. Stood several times alone when he apparently was aware of the fact.

370—All alone he got up in the middle of the room and walked off 5.5 feet. Often squats on haunches with no support. Walked exactly 7 feet alone. Each time when he stopped walking, it was not because he fell at that time. Instead, he slowly and gracefully sank by bending his knees.

376—He stood while I counted 52. Then he walked 10 feet. Hands were out at full length, held slightly forward. Always does best when he starts wholly alone. The only severe bumps he has got have come when we have tried to help him. Walks as if on stilts. Has not learned to properly flex knees. Walks most about 6 P. M.; least after rising in the morning. For the first he carried objects while walking, e. g., piece of cardboard, box, ball, diaper.

377—Reaching for an object out of sight on the table he jumped, clearing the floor with both feet. Walking speed—Five feet, 4 seconds; 5 feet, 5 seconds; 7 feet, 5 seconds; 4.5 feet, 2 seconds. Later, 12.5 feet, 10 seconds (38 steps).

379—Walked 15 feet without difficulty, returning without getting down.

378—Now beginning to use his hands, as for waving, while walking. Receives no hard bumps in walking when let alone.

380—Seldom creeps.

381—Carried a flatiron (19 ounces) about the room, walking with apparent ease. Very often carries things while walking. Readily rises from middle of floor without aid. Can stand and stoop down to pick up object, without support, not losing balance. Carried a saucepan 9 feet, then 15 feet.

383—Standing on one leg and holding to the couch he kicked a box with the other foot.

383—Thirty-five steps, 16 feet, 12 seconds; 25 steps, 11 feet, 8 seconds.

387—In walking he does not move his arms as adults do. Instead he moves them in unison.

390—Stood on one leg alone, swinging other. Carried an orange in both hands above his head. He can stop walking at any time and stand still, at once. Walks with feet from 3 to 6 inches apart. Still walks stilted.

394—Walked 54 steps the first minute; 47 steps, second minute; 83 steps, third minute; 79 steps, fourth minute. He fell several times first two minutes. Each attempt was a running forward till he fell. Later made 95 steps in 94 seconds, no falling. Rarely stumbles over toys.

403—Can easily step over obstacles 4 or 5 inches high. Has not learned how to sit down on a box or cushion. Struts about, shoulders back, belly forward.

407—Walked about 200 yards over rough road, but would not accept any aid.

408—Put one foot into a cigar box while standing on the other leg unsupported.

413—Jumps to goal as he nears it on a run. Sometimes while very happy his running is interspersed with jumps.

419—Has developed a kind of galloping—left leg rising higher than the other.

423—Fails in his attempt to kick things.

427—Running: 30 steps, 8 seconds; 36 steps, 9 seconds.

447—In running or walking over obstacles he is learning to flex the knees instead of throwing the legs over like stilts. Stepped backwards 3 feet to lean against the wall against which I was leaning. Learned to kick a ball on the floor.

466—Facing a box he turned about face to it and sat down. After discovering how to do this he repeated it 13 times.

481—Walked backwards half the length of the room, pulling his toy rabbit.

487—Walks backwards often and freely.

489—While walking has learned to turn the head independently of the body.

520—Stepped upon box 8 inches high, holding by the couch, but stepped down alone, making running movements to stop. Did this 27 times. When the box was removed to the center of the room he stepped up one side and down the other 74 successive times. Then seizing his toy rabbit he repeated the performance 76 more times in a total period of 20 minutes.

552—While very happy he is apt to go about walking or running on his toes.

556—Learned alone to sit on a cushion.

568—Walked around a whole city block.

580—Often stands for a few seconds on one foot. Repeatedly he stepped down from a platform 5 inches high and got his balance each time without any running movements.

582—As from the beginning of walking he selects roughest places to walk on. Walked eight blocks. Insisted always on stepping up and down curb alone.

589—Walked twelve blocks.

696—Can make as many as six successive jumps on spring bed, before losing balance. For few weeks has on several occasions whirled about like a spinning top until losing balance.

819—Tried but failed to kick football after throwing it upward.

837—Walked 1½ miles at a stretch.

842—Several times while in happy mood he stood alone on one leg and threw other leg into the air in various directions, maintaining balance.

865—Standing in an inverted shoe-box lid (cardboard) he jumped out of it with feet in unison. Later he jumped forward on the floor as far as 18 inches.

879—Stood on a block on one foot, other free, balancing himself for several seconds.

892—Jumped over a stick while I held it 4 inches from the floor.

976—Almost daily he walks about 1¼ miles.

BOOK NOTES

"The Revolt Against Civilization": The Menace of the Under-Man. By LOTHROP STODDARD. N. Y., Charles Scribner's Sons.

This is one of the wisest and most sagacious books that have appeared since the war. It is a volume that should be not only read but studied by our historians and sociologists and most of all by our statesmen. It presents better than any work we know the real problems now pressing upon not only this country but upon the civilized world. The author has a genius for synthesis and wide orientation and true vision of the future based upon the insight into present conditions. The perspective of the book, too, is admirable. The author nowhere loses himself in details of the many aspects of his theme which are brought under review, but remains true to his main purpose of showing that the world is in imminent danger of lapsing to the control of the "Under-Man" and that only eugenics given its widest application can save it. The style of the author, too, is singularly lucid. We believe that it is a book that hundreds of readers and those of the very best will wish that they had had wit to write themselves, and this is perhaps the best indication that the *Zeitgeist* has really found a voice in it.

It seems invidious to suggest any criticism of such a book, but if we were to venture to do so it would be that the author has not done justice to such expression of the folk soul as language and mythology and to certain fundamental religious and ethical ideas and institutions the origin of which cannot be ascribed to individuals, but are products of mass thinking and feeling, for it should not be forgotten that group activities and the instinct of the herd have given us not only mobs, but have also shown amazing creative power in the past, and that demos often symbolized as a beast has become at certain periods the chief agent of human progress. He is, too, in our opinion too *Weismannian.*

Principles of Social Psychology. By JAMES M. WILLIAMS. N. Y., Knopf, 1922. 459 p.

This work marks a real advance upon the author's "The Foundations of Social Science," and is devoted to a study of (1) the effect of economic conflict through social organization; (2) the clash of egoistic dispositions as a case of conflict; (3) the inevitable conflict between the egoistic and idealistic dispositions; (4) the failure of an idealistic leadership to win popular support. Conduct is considered in the interests of economic, political, professional, family, cultural and educational relations. There is an interesting closing chapter on the social reactions of suppressed impulses. The author here makes a real contribution to the psychological side of his topic and has written a book which sociologists will welcome and profit by. A suggestive bibliography of over twenty pages (although to our regret we find this confined almost entirely to English authors when there is so much foreign literature bearing upon the subject) adds to its value.

Early Civilization: An Introduction to Anthropology. By ALEXANDER A. GOLDENWEISER. N. Y., Knopf, 1922. 428 p.

After discussing man and civilization the author takes up illustrations of early civilizations—the Eskimo, Haida, an interesting chapter on the Iroquois matriarchate, Uganda, etc. Part II is devoted to industry, art, religion and society, and Part III to the ideas of early man, theories of his mentality by Spencer, Frazer, Wundt, Durkheim, Levy-Bruhl, Freud and others, with an excellent summary chapter on early life and thought. Although the work proposes no radically novel theories in this field it is an admirable compend, well written, judicious, learned and—which is rare praise—will be found, we think, to profit almost equally the expert who wants his general views revised to date and the beginner who wishes to start with a clear conspectus of the problems just now most interesting both to anthropologists and to the general reader. It is one of those rare introductions to a subject which specialists need to read once in a while to keep their perspective just and true.

Public Opinion. By WALTER LIPPMANN. N. Y., Harcourt, Brace & Co. 427 p.

From a more or less psychological point of view this able author discusses this theme so vital for a democracy, pointing out the various factors which constitute public opinion which is prone to be stereotyped, to be influenced by interests, etc. There is a very good discussion of newspapers and of the modes and organization of agencies for diffusing information and intelligence.

Nutrition and Growth in Children. By W. R. P. EMERSON. N. Y., Appleton, 1922. 342 p.

After spending several years in studying malnutrition among children, Dr. Emerson discards many factors generally believed to be the cause of malnutrition, i. e., insufficient food supply, improperly cooked food, etc., for he finds that many children of well-to-do parents are malnourished. He concludes that the matter is an individual problem and that the factors now to be considered are: home control, food habits, health habits, physical defects and overfatigue.

Dr. Emerson's work in Boston has attracted attention in other cities and is becoming widespread. He conducted a successful clinic in the East Side of New York City where it was demonstrated that the malnourished children could be made well in their own homes, the gains varying from 100 to 200% of the expected rate of growth for normal children.

This book is the result of his clinical experience, gives many photographs and records of individual cases, and covers a wide field including: Part I, How to identify the malnourished child, giving weight standards and tables, case histories, physical and growth examinations, mental and social examinations. Part II deals with malnutrition and the home, home control, overfatigue, measured feeding, food habits and health habits, exercise and recreation, and the overweight child. Part III discusses nutrition in relation to the community, the nutrition worker, the physician, nutrition and the school, and school lunches. It contains tables of weights, nutrition records, and is a valuable book for parents, teachers, and social workers.

M. R.

In Defense of Woman. By H. L. MENCHEN. N. Y., A. A. Knopf, 1922. No. 6, Free Lance Books. 210 p.

The author in his introduction gives us a brief account of himself. Born in Baltimore in 1880, chief-editor of a daily paper at 25, then drawn to literature and "public psychology." He tells us that women have little respect for the merit and authority of men. The latter think themselves heroes, but woman's intuition, which is really intelligence, sees through all the "masculine bag of tricks" represented by success in industry, business and professions. Her concern is about far more vital things. In marriage there is war between the sexes because men want pleasure and service and women support. The latter are not sentimental; only imperfect women care for male beauties. Woman's form as seen in war costumes is not aesthetic. Man is satisfied with the superficial things of dress and face powder, but, having been captured, he conceives himself as having taken the initiative and that his wife is beautiful, from sheer conceit. Women are not honorable in the old sense; that is their charm. No one is honorable in struggling for existence. We are so only when we are sure of winning. Every woman wants to marry a prince, millionaire or an ideal yet higher, and her demands slowly come down so that all of us plain men who may accept are her third or tenth choices. Loyalty to dead mates is brief. Men far more often marry beneath them than women, but the latter often feel their children are handicapped by the father they have. The law gives the married woman every right, and this is enforced by a romantic public sentiment. Marriage is the great enfranchiser. Piety is a social habit, and the attraction of the church is social. If a normal woman has any religion she gravitates toward Catholicism. Far more men than women go insane and more married than single. In the new age women are less inclined to marriage, and they even listen to Key and Sanger. A life of even professional looseness is not so bad even hygienically as we have thought, and even this life has its educative values. Husband and wife see too much of each other and should limit their contact, have vacations apart, etc. There will be more wars, and therefore a shortage of husbands.

The Reconstruction of Religion. By CHARLES A. ELLWOOD N. Y., Macmillan, 1922. 323 p.

This author holds that the salvation of the world can only come through the unity of all religions, Protestant, Catholic, Jewish and probably the great ethnic faiths of the East. No other human institution so embodies the idealistic aspirations of mankind as does the church. It must, however, be revitalized; and when the faith of the Founder is thoroughly understood, unity will be realized. The church preaches reconciliation but does not illustrate it. When it is Christianized, pagans will be converted. Many Jews are more truly Christians than many members of the Christian church. The "hospital" conception of the church as saving individuals must give place to a larger view that its chief duty is to socialize the world and increase the efficacy of all its teaching agencies, utilizing the press and school to deal with movements and forces, particularly those of public opinion, which is all controlling in modern society, as it has tried to do with the liquor traffic. We still have pagan mores in our western civilization, and it is mores that are really all determining. We only need a core of agreement and not uniformity of details. Public opinion must be free and disinterested and intelligent, and there must be a more scientific knowledge of social conditions. There is a higher kind of advertising that might be utilized. Bible teaching could be improved. In a word, the self-seeking impulses must be subordinated to altruism. The fact is selfishness has never inspired the devotion that unselfish ends can do. He would have the church specifically interested in justice, family life, better education, abolition of child labor, better regulation of toil, the prevention of poverty, temperance, health, better conditions for labor, provisions for old age, one day in seven of rest, a living wage, etc.

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THE WILL TO LEARN

AN EXPERIMENTAL STUDY OF INCENTIVES IN LEARNING

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2. How Will To Learn and Confidence in Success May Best Be Aroused and Maintained in Learners
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I. Problem

1. *Historical.* Much has been written concerning the limits of improvement in learning and the factors which condition the rate and amount of gain which may be made. In the various learning studies made during the last twenty-five years many facts have been assembled which throw light upon both these problems. Bryan and Harter,[1] in summarizing the results of their study of learning the telegraphic language, said: "A fact which seems to be highly significant is that years of daily practice in receiving at the ordinary rate will not bring a man to his own maximum ability to receive. The proof of this fact is that a man whose receiving curve has been upon a level for a number of years frequently acquires a much higher rate when required to do so in order to hold a position requiring the higher skill. That daily practice in receiving will not insure improvement is also seen in the fact that inferior operators after being tolerated for years are finally dropped because they do not go far enough above the deadline. One conclusion seems to stand out more clearly from these facts than any other, namely: that in learning to interpret the telegraphic language, *it is intense effort that educates.* This seems to be true throughout the whole length of the curve. Every step in advance seems to cost as much as the former. Indeed each new step seems to cost more than the former."

Senator Stanford in describing his experiences in training and rearing race horses said:[2] "My own idea, and I think it is borne out in practice, is to commence working a colt early, developing its strength with its growth. If the exercise is judicious the colt is not harmed by it. I do not remember a single instance when an animal of mine has been injured by early work. When a breakdown has occurred it has been after a let-up. Let-ups are very dangerous to young fast animals, as their bodies grow during the let-up without corresponding development of strength. And they are very liable to get too much work when their exercise is renewed. My aim is to get the greatest amount of exercise without fatigue, and never to allow it to reach the period of exhaustion. This is secured by *short distance* exercises. *It is the supreme effort that develops.*"

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[1] Bryan and Harter, "Studies in the Physiology and Psychology of the Telegraphic Language," *Psychological Review*, Vol. 4, Jan., 1897, p. 50.

[2] Senator Stanford, *Scribner's Magazine*, June, 1896.

In a study of the acquisition of skill in typewriting, 1908, the writer made a detailed analysis of the learning process involved in both the sight and touch methods, by a technique which revealed not merely the specific habits which were developed in the course of the practice, but which showed just how these habits were formed and finally perfected as the learning progressed.[3] Various phenomena and conditions which influenced the learning helpfully and hurtfully were also determined and their exact influence on the rate of improvement described. This study showed that *intense effort efficiently applied to the details of the work* was a necessary condition for improvement in this type of learning. Only when the learners were in first-class condition, feeling good and applying their best efforts to the details of the work, did they succeed in inventing new and better methods of control or varying their former procedure in a helpful way. The plateaus in the learning curve, or periods of non-improvement encountered in the learning, were brought about by a combination of causes, chief among which was found to be a slump in the amount of effort applied to the details of the work. This prevented the learners from inventing the higher and more economical methods of writing employed by an expert, and resulted as a rule in a careless oversight of the details of the work and a consequent failure to practise the writing on the highest plane that was possible for them. Plateaus in this type of learning were found to be unnecessary and the suggestion was made that they could be eliminated from the learning curve if only the learners could be kept sufficiently interested in their work and directed in a way that would enable them to overcome the special difficulties encountered in the learning at the critical stages. The suggestion was also made that interest in improvement as such was an important factor in bringing this about.

Meumann and Ebert[4] in an extensive study of learning to memorize showed that the memory ability of children and adults could be materially improved by a brief amount of laboratory practice. Their subjects ranged in age from 7 to 54 years, and improved their ability to memorize on the average from 20 to 40 per cent during the brief practice periods arranged in the experiments, whereas, as they pointed out, the memory ability of school children and adults in college is improved very little by all the enormous amount of memory work that is done in the schools. The theoretical reason assigned by Meumann for this lack of improvement in memory ability is that every advance in mental or bodily skill which results from practice is in the last analysis a phenomenon of will.[5] "We profit by continuous practice," he says, "only in proportion as we incite the will to progress or arouse an intention on the part of the learner to improve. The mere repetition of an act even though it be repeated daily is by no means sufficient to bring about an improvement in the execution of the act." The reason why the memory drills in the schools do not result in improvement is that the attention of the learners is not directed towards the improvement itself, but is focussed on the grammar, the arithmetic, or the poems that are to be learned.

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[3] Book, W. F., "The Psychology of Skill," *University of Montana Studies in Psychology*, No. 1, 1908, see especially p. 100-53.

[4] "Economie und Technique des Lernens," *Archive für die Gesamte Psychologie*, Vol. IV, p. 1-232.

Meumann, E., "Psychology of Learning," p. 357-9.

That this interest in improvement is a *necessary* factor in acquisition if the learner is to progress beyond the ordinary limits of skill is indicated by Bryan and Harter's findings that between 60 and 65 per cent of those who begin telegraphy become discouraged upon the plateau of the curve just below the main line rate, and by the results of an unpublished study by Dr. H. D. Kitson of Indiana University.[6] He studied the daily output of 40 hand compositors at the Lake Side Press, Chicago, for a period of 12 months and found that under a specially arranged bonus system set up in that establishment the efficiency of every man was increased on the average from 58 to 97 per cent in 20 weeks. All were experienced printers when they entered the plant and had worked at the trade from one to twenty-seven years. The average experience for these men was 10.3 years. But notwithstanding this fact they made a gain in their output in 5 months under the stimulus of a bonus system of 67 per cent over and above the average score made at the end of the first week of service. One man who had worked at the trade 27 years made a gain of 142 per cent. A man who had been working at the trade 14 years increased his rate of work 282 per cent. The most experienced half of these workmen increased their output on the average 50 per cent while the half which had the least experience at the trade (6.3 years) made an average gain per man of 75 per cent. And though they were all considerably below the minimum bonus point in output when they started to work in the plant, the study showed that under the influence of the bonus and a knowledge of their daily score, 21 out of the 40 men had exceeded the bonus point at the end of the fourth week. In 5 months 35 out of the 40 men had reached this point; 50 per cent of the men had increased their rate far beyond the bonus point and so were receiving the extra pay.

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[5] Meumann, E., "Psychology of Learning," p. 360-4.

[6] The writer wishes to acknowledge his special indebtedness and grateful appreciation to Dr. Kitson for the use of this material.

That we have here a genuine case of learning, taking place in men who had worked at the trade some of them as long as 27 years, seems clear. If it were a mere case of speeding up or the expenditure of more effort the results would have been more immediate and the increase would not have been spread out over so long a period of time. That it is a genuine case of learning induced in well-seasoned printers by the desire for improvement and an exact knowledge of their advancement is further shown by the fact that the less experienced half of the workers, those who had worked at the trade on the average only 6.3 years, improved their rate of work 75 per cent while the more experienced half of the group, who had worked at the trade on the average 14.3 years, increased their output only 50 per cent. It is reasonable to conclude that the more experienced workers being more set in their habits and methods of work found it harder to leave their old and less efficient habits of work behind and therefore more difficult to invent the new and better methods of working required to increase their skill.

These and other studies[7] which might be mentioned have indicated pretty clearly that interest in improvement has a direct effect upon the rate and amount of advancement in learning which a given subject will make in his practice. What is needed is more experimental data which will show not merely the amount of effect which this group of factors may produce, but the elements which make it up and the channels through which the improvement comes.

Facts gathered from a rather wide field indicate that even the so-called physiological and mental limits of improvement may be much extended by this group of factors. Thorndike, for example, after reviewing the literature dealing with rate and amount of improvement in learning[8] states that few if any learners ever reach the limits of improvement for them. "The main reason," he says, "why we write slowly and illegibly, add slowly and with frequent errors, delay our answers to simple questions and our easy decisions between courses of action, make few and uneven stitches, forget people's names and our own engagements, lose our tempers, and the like, is not that we are doing the best that we are capable of doing in that particular. It is that we have too many other improvements to make, or do not know how to direct our practice, or do not *really care enough about the improvement*, or some mixture of these three conditions."

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[7] G. F. Arps in his ergograph study "Work with Knowledge of Results versus Work without Knowledge of Results" showed that his subjects did more work and worked faster when they had a knowledge of results than they did "under the conditions of ignorance of results." *Psychological Review Monographs*, Supplement, Vol. 28, No. 3, p. 40.

C. H. Judd in his study "Practice without Knowledge of Results" found that greater efficiency occurred when the observer was aware of the conditions underlying the procedure of the experiment. *Psychological Review Monograph*, Supplement, Vol. 7, 1905. See also C. H. Judd, "Practice and Its Effect in the Perception of Illusions," *Psychol. Rev.*, IX, 1902, 27-9.

[8] Thorndike, E. L., "Educational Psychology," Vol. II, p. 178 f.

"It is my impression," he continues, "that the majority of men remain far below their limit of efficiency, even when it is decidedly in their interest to approach it, and when they think they are doing the best that they are capable of. I venture to prophesy that the thousand or more bookkeepers in the grocery stores of New York City who have each had several thousand hours of practice in addition, are still, on the average, adding less than two-thirds as rapidly as they could, and make twice as many errors as they would at their limit. It also appears that the majority of teachers make no gain in efficiency after their third year of service, but I am confident that the majority of such people could do very much better than they do. Even in a gain where excellency is zealously sought the assertion that 'I stay at just the same level, no matter how much I practice' probably does not mean that the individual in question has really reached the physiological limit set for him in that function." He concludes, though on purely theoretical grounds, there being no experimental results to throw light on the question, that one of the chief reasons why such individuals do not reach the limits of their improvement is because they are not really interested enough in making further gains and so do not put forth the necessary effort required to invent the new and better methods of work.

William James in his essay on "The Energies of Men" makes a similar theoretical assertion when he maintains that no one has ever succeeded in tapping his full stores of energy, or used all his powers to advantage in the business of learning.[9]

2. *Purpose of Present Experiments*—These quotations emphasize the need for further experimentation in this field and help to make clear the particular problem we desired to investigate in these experiments. Thorndike said he could not prove the assertions made in the paragraphs we quoted since

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[9] James, Wm., "The Energies of Men," Religious and Medical Edition, Vol. 3, p. 7-8 and 15-6.

the experiment of subjecting such individuals to practice under proper conditions of method and interest had not been made. But such experiments should be made and it was the purpose of this study to subject the suggestions regarding the dynamic influence of effort in learning and the helpful effect of interest in improvement as such, made by Bryan, Thorndike, Meumann and Book, to a rigid experimental test and if possible to determine the kind and amount of influence which this group of factors may exert upon one's ability to improve. As a sort of corollary to this problem it was hoped that the data gathered would throw some light on the problem of the so-called limits of improvement in the types of acquisition we selected for study as well as on the channels through which this improvement comes.

II. METHOD

1. *Subjects and Types of Acquisition Studied*—One hundred and twenty-four junior and senior students at Indiana University—48 men and 76 women—were given four simple learning tests, the first involving 75 practice periods, the other three, 45 practices each. The types of acquisition selected were: (1) improving a purely muscular feat, making the small letter "a" accurately and as rapidly as possible; (2) learning to locate and cross out certain letters in a uniform list of disconnected Spanish words; (3) a case of learning where a simple set of psycho-physical habits must be formed and fixed; (4) learning to multiply mentally one two-place number by another.

These four kinds of learning were selected because they represent widely different types of acquisition. The first consists of improving a purely muscular feat, already learned, which on *a priori* grounds does not seem capable of being greatly improved. The second involves discrimination, skill in eye movements and a co-ordination of certain perceptual and motor processes. The third experiment measures .the rapidity with which a simple set of psycho-physical habits can be formed and perfected for quick and accurate use. Our fourth experiment was selected because it involved the acquisition of a purely mental feat, i. e., making the combinations involved in mental multiplication, by imaging the numbers and holding them in mind until the process of combining them could be completed and the correct answer written down.

It was believed that, if the influence of the group of factors to be studied in our experiments were determined for each of these varied types of learning, the results would be fairly indicative of the influence which these factors exert in all types of acquisition.

2. *Length and Distribution of the Practices*—All practices were taken during the regular laboratory periods for the experimental classes in Psychology from 1 to 5 in the afternoon on Monday, Wednesday and Friday of each week. Section I took its practice between 1 and 3 o'clock, Section II between 3 and 5. The practice periods for the different types of acquisition varied from 30 seconds in experiment 1 where 75 practices were taken, to 1 minute in experiments 2 and 3, and 1 minute and a half in experiment 4 where 45 practices were taken at regular intervals on the same days for each section. In experiment 1, twenty-five practices, arranged in the form of 5 tests, were given each day. In experiments 2, 3 and 4, fifteen practices were given each day, with an interval of time allowed between the practices sufficiently long to counteract all fatigue effects. In experiment 1, one minute was allowed for rest after each practice and a 5-minute rest period given between each group of practices. In experiments 2, 3, and 4 two minutes were allowed for rest after each practice and a 10-minute interval given between the tenth and eleventh test on each day. A 7-day interval was also allowed between the close of one experiment and the beginning of the next, to avoid interference effects, and no practice was taken in any of these experiments except during these regular test periods when an accurate record was kept of each subject's complete output, including mistakes.

3. *Special Conditions Imposed*—For the purpose of studying the effect of interest in improvement upon ability to learn, the subjects were divided into two groups referred to throughout this report as Sections I and II. In the first experiment the members of Section II were asked to count their score after each practice in the first 50 trials and to record in a prominent place on their test sheets the number of "a"s made during the practice, and in other carefully planned ways they were interested as much as possible in the improvement they were making. They were also made to feel that they could increase their score in practically every practice and test. The members of Section I were, on the other hand, kept ignorant of their score during these first 50 practice trials by having them fold their papers at the end of each trial in such a manner that they could not see how many rows of "a"s they had made or how large a space had been covered on their test sheets during the practice. They were, however, urged at the beginning of each succeeding

test, the same as the members of Section II, to work as rapidly and conscientiously as they could in every practice and test. But no attempt was made to try to interest the members of this section or any control group in the possibility of their improvement or in the gain they were making.

During the last 25 practice trials in this experiment the procedure for the two sections was reversed. That is to say, at the beginning of the fifty-first practice or eleventh test each member of Section I was given a sheet of paper containing the highest score he had made in any of his previous practices and told that he could surpass this record in each succeeding practice if he made up his mind to do so. The members of this section were also required to count their score after each of the remaining 25 practices and to record it in a prominent place on their test sheets. They were also allowed to keep their test sheets on the table before them while they worked. In this manner and by other specific directions given to the members of this section at the beginning of the last 25 practices, they were interested as much as possible in the gain they were making from trial to trial. The members of Section II were during these last 25 practices kept ignorant of their score by the same method of folding their record sheets used for Section I in the first 50 practices. They were also told before beginning the fifty-first practice to forget, if they remembered, the highest score made in any of their previous practices.

For the other three experiments the procedure was the same except that in the second and fourth experiments Section II was used as a control group in the first two-thirds of the practice and Section I was made the stimulus group.[10] For example, Section I was permitted to count their score in the first 30 tests of these experiments and interested as much as possible in their rate of improvement; Section II was kept ignorant of the progress they were making during these first 30 tests. But at the beginning of the thirty-first test each member of Section II was given the highest score made in any of his previous practices, and interested as much as possible in the possibility and fact of their improvement. This procedure was again reversed in experiment 3 and made the same as in experiment 1, each section in its turn being subjected in the first two-thirds of the practice to the group of incentives provided in our experiments, and in the last one-third of the practice to the other set of conditions as the case might be. This procedure is indicated in Table I, which shows how the two sets of conditions were varied for each section in the different experiments.

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[10] Throughout the rest of this report the section which was exposed to this special group of incentives for the first two-thirds or last third of the practice will be referred to as the stimulus group; the section which was not thus being interested in their improvement, as such, will be called the control group.

TABLE I

Experiment	*Sections*	*First two-thirds of practice*	*Last third of practice*
1	I	Control	Stimulus
	II	Stimulus	Control
2	I	Stimulus	Control
	II	Control	Stimulus
3	I	Control	Stimulus
	II	Stimulus	Control
4	I	Stimulus	Control
	II	Control	Stimulus

4. *Method of Controlling the Conditions*—A special set of directions to the members of each section was prepared for each experiment before the practices began and the procedure to be followed was tried out on a small training group to make sure that the experiment could be successfully carried out as planned and the special set of conditions arranged, controlled. For making the "a"s in the first experiment ordinary 8 x 12 sheets of paper were used and each practice numbered in the center of the page so that the result of each practice could be accurately determined and the record made folded under for the control groups immediately after each trial. These test sheets were taken up in the control groups after each test, which consisted of five separate practices or trials. In this manner we succeeded entirely in keeping the subjects of our control groups ignorant of their score and so from becoming interested in the improvement they were making. The members of the stimulus groups, on the other hand, were required to count their score at the end of each practice and interested as much as possible in their improvement by the special devices to be described in section 5 below.

For experiment 2 a heterogeneous list of Spanish words were printed on uniform sized test sheets. Enough of these sheets were given to each subject at the beginning of each practice period to serve for all practices that day. These were placed face down on the tables and kept so until a signal was given to begin the practice, when the top sheet was turned over and marked as previously directed. Four attendants were stationed in the room when the tests were given to see that directions were carried out and to collect the papers promptly from the control groups after each test. For the stimulus sections the finished test sheets were turned face down with the score made during the practice marked on the back of the sheet and kept in sight during the rest interval and the following practice. But notwithstanding these and other precautions taken in this experiment to keep the members of our control sections from becoming interested in the gains they were making, there was a tendency on the part of some subjects in our control group to try to keep track of about how far down the page they had gotten in the list of words when time was called. In other words, we did not succeed so completely in experiment 2 in keeping the members of our control groups from becoming interested in the gains they were making as we did in experiment 1.

In experiment 3 the digits to be translated into letters were arranged in series of five-place numbers on a 9 x 12 sheet of paper, in two vertical columns, the numbers to the left, and five spaces directly opposite each number for the five letters which were to be substituted for the digits composing it. The key was placed at the top of the page and the learners were required to begin their substitutions at once without memorizing the key. The test sheets had been thus arranged to facilitate the scoring of the papers. Each number was made of the same degree of difficulty by the proper alternation of the digits used, which fact had unfortunately been explained to the learners before the test began. This made it difficult in this experiment to keep the subjects in our control groups wholly ignorant of their score and consequently from becoming interested in their rate of improvement. All other precautions used in experiments 1 and 2 to control this condition were carefully observed; and when this tendency on the part of our control sections to keep track of the progress they were making was discovered, during the course of the experiment, we arranged to ask the members of each section at the conclusion of the practice whether or not they had succeeded in following the instructions exactly as given them. More than half the members of both control groups in this experiment stated that they could not help but be vaguely aware of their score and could not resist the tendency to keep some track of their improvement by noting how far down in the list of numbers they had gotten in their translation when time was called. Many also stated that they observed themselves trying to go beyond that point in succeeding practices, showing that they were really interested in their rate of gain.

The bearing of these facts on our results will be discussed in the section on results.

In experiment 4 this tendency on the part of our control groups to keep track of their score and to interest themselves in their improvement as such was more successfully broken up. The problems were made equally difficult by taking all possible combinations of the nine digits and arranging them so that the problems would be of the same degree of difficulty on different parts of the test sheets. For our control groups the problems were arranged in the same order as for the stimulus sections but in such a way that there was an unequal number in each row on successive test sheets. To prevent them further from becoming interested in their improvement the learners were told at the beginning of the experiment that the problems were not of the same degree of difficulty but would have to be weighted to determine their real score or the amount of gain made in succeeding tests. These devices were successful in breaking up the tendency of our control sections to keep track of their score and so to interest themselves in their improvement as such, a tendency which tended to become stronger as our experiments proceeded and as the subjects of each section became more and more interested in both the experiment and in the fact of their improvement.

In this last experiment a separate stimulus sheet containing the entire list of problems was used for each test as in the other three experiments. These were placed face down on the table before the subjects. At a prearranged signal this sheet was turned over by the subject and the numbers constituting the first problem fixed in mind. As soon as these numbers were noted the sheet was promptly turned face down until the problem was mentally solved, when the answer was recorded in its proper place and the next problem learned; the process was repeated to the end of the practice, when the papers were taken up for the control group, and turned face down for the stimulus groups with the score made in the practice recorded on the back of the stimulus sheet. If in the process of thus solving a problem mentally a subject forgot one of the numbers or had not fixed the problem firmly enough in mind when the stimulus sheet was referred to the first time, he was directed to look at it promptly a second time.

Because of the nature of this fourth experiment and the special conditions imposed two factors became prominent in this type of acquisition. The test sheets contained many more problems than could be finished during the practice, even after considerable skill in this type of performance had been acquired. The subjects were therefore asked in each practice to begin with the first problem and to proceed as far down the list as they could. This put a premium on the memory factors involved. Those who could retain and recall the answers to the problems which had been solved in previous practices could, of course, simply write down the correct answer in succeeding tests for all the problems that had been mentally solved in previous practices. This put a premium on accuracy and made the rate of gain relatively rapid in this experiment. To determine therefore the actual amount of gain which each subject and section made during the practice in developing the more *purely mental* functions involved in mentally multiplying one two-place number by another, we gave each section three extra trials, after the regular practice had been completed, using a list of new problems of the same degree of difficulty as those in the original list. The average scores made in these last three practices were then compared with the average scores made in the first three tests, to give us the absolute amount of gain made in the entire practice. In all other experiments the absolute and relative amount of gain made by each subject and section was determined by using their initial and final or highest score.

5. *Method Used To Interest the Subjects of the Stimulus Groups in the Fact and Possibility of Their Improvement*—Several devices were used to interest the members of our successive stimulus groups in the fact of their improvement, to arouse their "will to learn" and to establish in their minds a firm belief in the possibility of their continued advancement. The devices used were carefully planned and tried out before the regular experiments began and were given as directions to the group always in the same way. The following points were emphasized in this part of our directions:

(1) The members of all stimulus groups were required to count their score after each practice and to keep this score prominently before them while they worked as already indicated. This demonstrated the fact of their improvement or lack of improvement as the case might be.

(2) By other uniform directions given to the stimulus groups both before and during the practice we tried to make each subject believe that he really could increase his score from test to test. Members of these sections were frequently told that if they would only make up their minds to increase their score they would somehow find a way to do it. Our accurate method of measuring their output and having them keep track of their score usually convinced them that this was true. In the individual cases where such improvement did not occur, if brought to the experimenter's attention during the rest

interval between the practices, the individual was given personal assurance that he or she really could improve if only he made up his mind to do so. They were generally told to indicate by a mark at the beginning of the test, a point on their test sheet a short distance in advance of their best previous score and to say to themselves that they would reach it that practice.

(3) The members of the stimulus sections were also urged at the beginning of each practice period to do their best that trial, a direction which was, however, repeated in identical form to the control groups.

(4) The members of the stimulus sections were also asked at the beginning of each series of tests to study their scores and to be on the alert for anything that might occur during the practice to facilitate the learning or work and to utilize all such discoveries in future practices, avoiding just as carefully everything that tended to hinder them.

(5) At times the stimulus sections were also told that they really ought to make more improvement than they were making.

(6) At the beginning of the last third of the practice in each experiment the members of the section which had been the control group in the previous practices were given a record sheet showing the best score they had made in any of the previous practices and told they could surpass this record in almost every test, and urged to exceed this score as much as possible in each succeeding test. The control sections were, on the other hand, told at the beginning of the last third of the practice to pay no attention whatever to the score they were making or to their rate of improvement. They were asked so far as possible to banish all thought and desire for improvement as such from their minds, but were admonished at the beginning of each test, the same as the stimulus groups, to do their best on every test, and to make as high a score as possible.

6. *Special Advantage of the Method Used*—The device of thus alternating the conditions for our sections in each experiment, making each section first a control group and then subjecting these same individuals to the set of conditions whose influence we desired to determine, was used because we desired to measure the amount of influence exerted by this group of factors on the rate and amount of improvement made by the members of each section, and for each type of learning studied. Because of inequalities in the initial ability of the two groups to do the tasks that were to be learned, and of the different rates of improvement which these two groups

of individuals might naturally make, we desired to test the effect of the special group of incentives studied always on the same group and for each type of learning. To make either section a permanent control group would be open to grave objections, as the reader will readily see, while if we alternated the control groups in successive experiments we would still have a variable factor in the fact that the two groups might show a difference in initial ability and rate of improvement in the particular types of learning studied. Our method of making each section first a training and then a control group for each type of learning avoids all these difficulties, and enables us to study the effect of our special group of incentives upon both groups of individuals and for each type of learning selected.

III. Results

The record made by each subject in each practice of our four experiments was determined by counting the actual number of "a"s legibly written (experiment 1), the number of letters correctly located and crossed out (experiment 2), the number of correct substitutions made (experiment 3), and the number of problems correctly solved in each of the practices taken by our 124 subjects. In tabulating these results original data tables were made out for the individuals belonging to each section, the record for the men and the women being kept separate for study and comparison in each experiment. These original tables (four for each experiment) therefore contained the name of each subject and the score he made in each of the practices for each experiment; also the number of errors made in each practice. From the data contained in these original tables learning curves were constructed for each subject and a composite learning curve for all the men and all the women of each section showing the average record made in each practice and for each of the four experiments.

And since each individual and section was subjected during the first two-thirds of their practice, in each experiment, to the special group of incentives we studied and during the last third of the practice to the opposite set of conditions, or *vice versa* as the case might be, these curves picture the effect of the special set of incentives imposed in our experiments upon the rate and amount of gain made during the practice when these individuals or groups were thus subjected to each set of conditions. The absolute gain is shown by the direct increase in score. The relative gain made by each individual and section was determined by calculating from the data contained in our original tables the per cent of improvement made during the period of practice when they were subjected to each set of conditions, and for the practice taken as a whole. The degree of conscientiousness or care with which the sections worked when serving as a stimulus or control group is indicated by the number of errors[11] made.

1. *Variations in Rate and Amount of Improvement Made by the Stimulus and Control Groups in the Various Experiments*—The amount of influence which interest in improvement and belief in its possibility exerted on the rate and amount of gain made during the practice in our several experiments is therefore shown (1) by comparing the absolute amount of gain made when the individuals and sections were being subjected to this special set of incentives during their practice (i. e., when they acted as a stimulus group) with the gain made by the same individuals or groups in the same type of learning when they were not thus stimulated by this group of incentives (i. e., when they served as a control group). (2) By comparing the relative amount of gain or per cent of improvement made by each individual or group when subjected to this set of incentives with the per cent of gain made by the same individuals or groups when they were not being thus interested in their improvement as such.

The results of these comparisons are striking and conclusive. The absolute amount of gain made by our several stimulus and control sections as well as the character of their improvement is shown in a series of practice or learning curves presented in Figs. 1 to 16. These curves indicate the absolute amount of improvement that was made by the men and women of each section in all of our experiments. The records for the men are indicated throughout by the heavy or unbroken lines, the records for the women by the dotted lines. Each curve represents the practice of a section which served both as a stimulus and a control group, it being an essential part of our method to use each section both as a stimulus and a control group, at different stages of the practice in each experiment. Whether a curve, or any part of it, indicates the result of practice by a stimulus or a control group is indicated in each figure.

The *relative* gain made by each section in our several experiments is shown in Table II, which gives the per cent of improvement made by each section, men and women taken separately, while serving both as a stimulus and a control group. The per cent of gain made by the stimulus sections is written in black-faced type to make it easily distinguishable from the gains made by the various control groups.

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[11] In determining the score made in experiment 1 only the "a"s were counted that were legibly written, the subjects being told when the practice began that they would be thus marked. No mistakes could therefore occur in this experiment. In the other three experiments the number of errors made in each practice were ascertained and deducted from the total score made in the practice and studied in relation to the rate and amount of improvement made.

(a) *Absolute and Relative Amount of Gain Made by Each Stimulus and Control Section in the Several Experiments*— A mere glance at the data presented in these various figures and in Table II will show (1) that the stimulus sections in all our experiments make more rapid and continuous gains than do the members of our control groups; (2) that each section or group of individuals when they are being interested in the fact of their improvement as such make rapid and continuous gain, and cease suddenly to improve when subjected to the opposite set of conditions; and (3) that a section which has not been thus subjected to this special group of incentives during the first two-thirds of their practice, if definitely interested in the possibility and fact of their improvement at the beginning of the last third of their practice, will suddenly begin to make rapid gains in their output which then proceeds rapidly and continuously to the end of the practice (compare Figs. 1 to 4).

Taking as an example the record made in experiment 1 it will be seen that both the men and the women belonging to Section II improved much more rapidly and continuously during the first 10 tests (50 practices), when they were being specially interested in their improvement as such, than did the members of Section I who served as a control group during these practices (compare Figs. 1 and 2 and the curves for the men and the women of Sections I and II in Figs. 3 and 4). But at the fifty-first practice or eleventh test, when the conditions were reversed for the two sections, the combined curve for all members of Section I, who were now being specially interested in their improvement, makes a very decided upward bound and continues to rise rapidly for the rest of the practices (see Fig. 1), while the curves for both the men and the women belonging to Section II, who were now prevented from interesting themselves in their improvement, show a sudden decline at this point (see Fig. 2). And while they rose slightly after the fifty-first trial, no real gain was made during the rest of the practices. They were still far below the highest point attained in the first fifty trials when the practice ended. These facts are strikingly shown by Figs. 3 and 4, which bring together for the sake of ready comparison the record made by the men and women belonging to these sections, enabling one to compare directly for the same periods of prac-

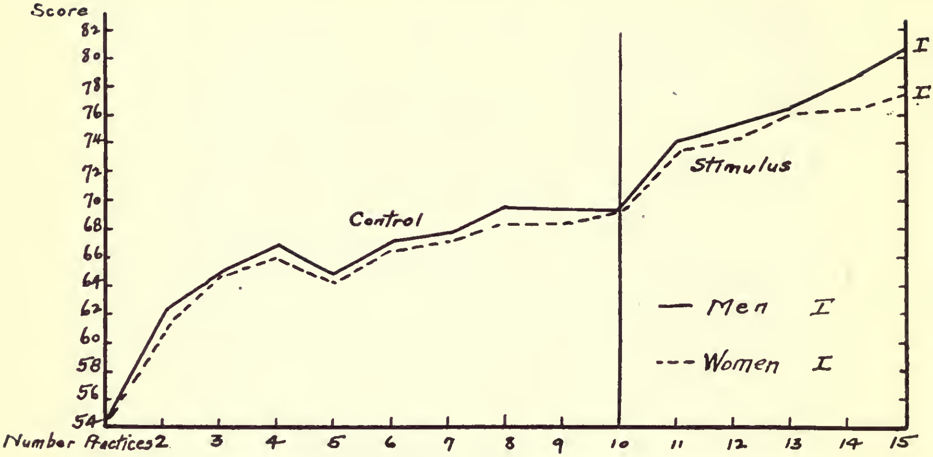

FIG. 1. LEARNING CURVES FOR MEN AND WOMEN OF SECTION I IN EXPERIMENT I

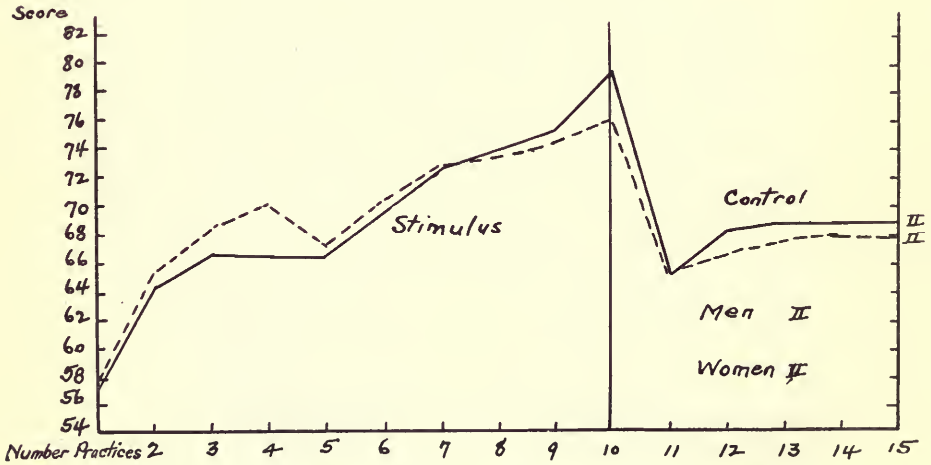

FIG. 2. LEARNING CURVES FOR MEN AND WOMEN OF SECTION II IN EXPERIMENT I

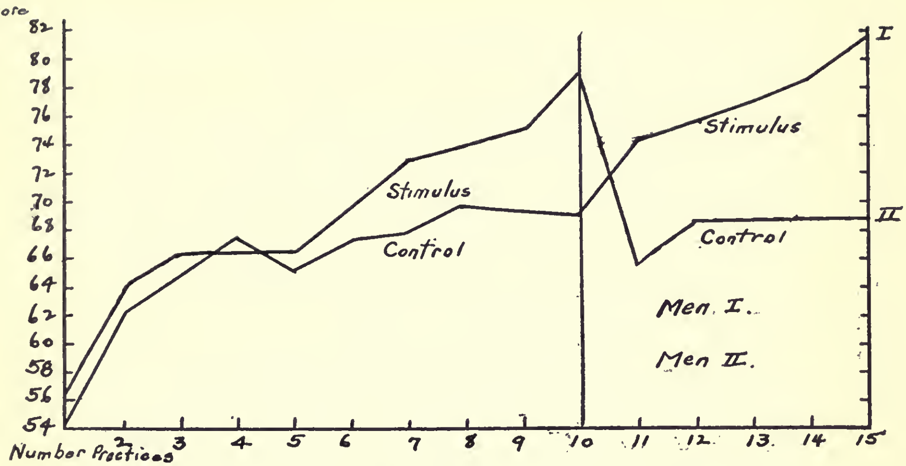

FIG. 3. LEARNING CURVES FOR MEN OF SECTIONS I AND II IN EXPERIMENT I

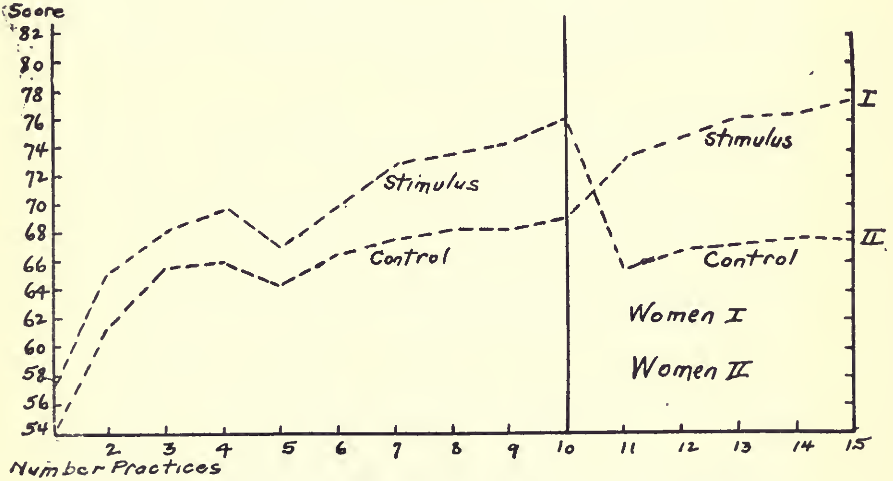

FIG. 4. LEARNING CURVES FOR WOMEN OF SECTIONS I AND II IN EXPERIMENT I

tice the record made by the section which was being subjected to our special group of incentives with the record made by the section which was not.

Moreover, what is true for the groups taken as a whole is true for *all* the individuals composing it. That is to say, the individual learning curves follow exactly the same course as the composite or group curve, showing that each individual in the stimulus section was helped somehow by a knowledge of his score and by the interest and confidence which we aroused in his ability to improve. When these specially arranged incentives, designed to arouse their "will to learn," were removed and transferred to the members of the control section a reverse result was obtained for the men and women of both sections. That is to say, every subject belonging to a stimulus group, where he was being specially interested in his rate of gain, made a rapid and continuous improvement throughout the practice, but when he became a member of a control group his curve showed a much less rapid rise (first two-thirds of practice) or a sudden drop (last third of the practice) as the case might be. To be more explicit, *every* man or woman in experiment 1 belonging to Section II, our stimulus group, made very rapid and continuous improvement during the first 50 practices, but in each of the last 25 practices his record fell below his or her best previous score, and conversely for Section I, the control group in this experiment. Each man and woman belonging to the latter section made a marked and continuous gain in the last 25 practices over and above the best record made during the first 50 practices. (See Figs. 1 and 2.)

And what is true for their absolute gain holds true for the relative gains made by the various stimulus and control sections (see Table II). That is to say, the individuals in experiment 1 who were subjected to our special group of incentives made a higher percentage of gain during that period of practice than did those who were not. The combined results are shown in Table II, which gives the percentage of gain made by the men and women belonging to each of our original sections when they practised as members of both a stimulus and a control group in each experiment. In every experiment save one do the members of the stimulus sections show both a greater percentage of improvement and a greater absolute gain than do these same individuals when they are members of a control group. The only exception occurred in the third experiment where Section I, the control group, made practically as much relative gain in the first 30 practices as did the members of Section II which served as the stimulus group (see

Table II). The learning curves for this experiment show the same tendency (see Figs. 10 to 14). For the first 30 practices in this experiment the learning curves for the control group rose about as rapidly as did the curves for the stimulus group. The curve for the control group in the last third of the practice also continued to rise somewhat in this experiment, but the curve for the stimulus group (Section I) now shows a sudden rapid rise which continues during the rest of the practice, showing the marked and continuous effect of our special group of incentives on the rate and amount of improvement made by this stimulus group. As will be recalled, it was in this experiment that we failed to control completely our conditions for the control groups as has already been pointed out in the section on Method (see section II, page 314 above).

This seeming exception to the general rule is explained by the supplementary data obtained from our learners in this experiment which showed that 80 per cent of the subjects in our control groups were definitely interested in their improvement as such and had kept some track of their progress, while many members of the stimulus groups were perversely stimulated by our set of directions during these same practices. The answers to our special questions given in writing at the close of the experiment showed further that the intense desire to excel each previous record, which we instilled in our stimulus groups, made many members push themselves along more rapidly than they could go during this practice, while in the last third of the practice when they were supposed not to be interested in their improvement at all, about three-fourths of them stated that they were definitely keeping track of the gains they were making, many adding that they had observed that they not only were locating the point on the test sheet which they had attained in the previous practice, but had repeatedly noted that they were actually trying to surpass that point in succeeding practices, contrary to the directions given them as members of the control group. This partial exception to the general results obtained in all the other experiments therefore becomes not so much an exception to the rule but additional evidence of the positive and helpful effect of the group of incentives which we isolated for study in these experiments.

The results of our first experiment are therefore typical of all the rest. Notwithstanding the fact that the complexity of the learning process increased in our later experiments and the fact that the knowledge gained in previous experiments while serving as a stimulus group made it increasingly more difficult to keep our control sections from keeping track of their scores

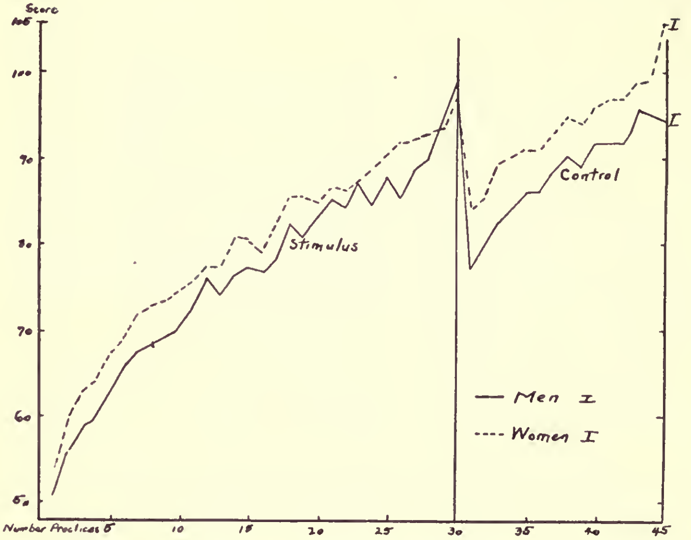

FIG. 5. LEARNING CURVES FOR MEN AND WOMEN OF SECTION I IN EXPERIMENT 2

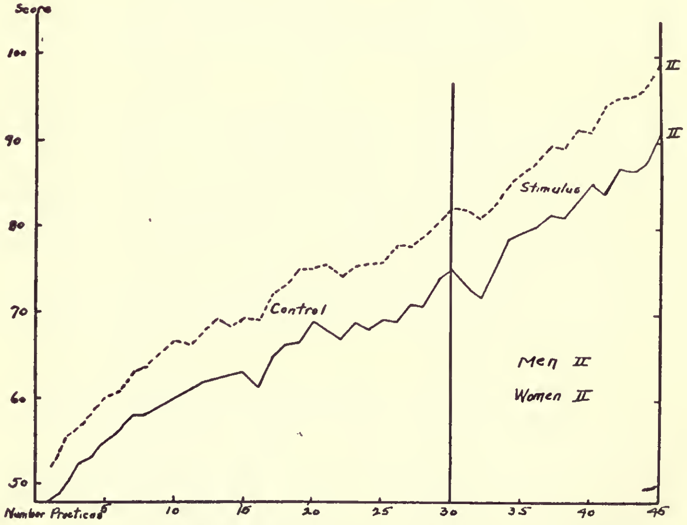

FIG. 6. LEARNING CURVES FOR MEN AND WOMEN OF SECTION II IN EXPERIMENT 2

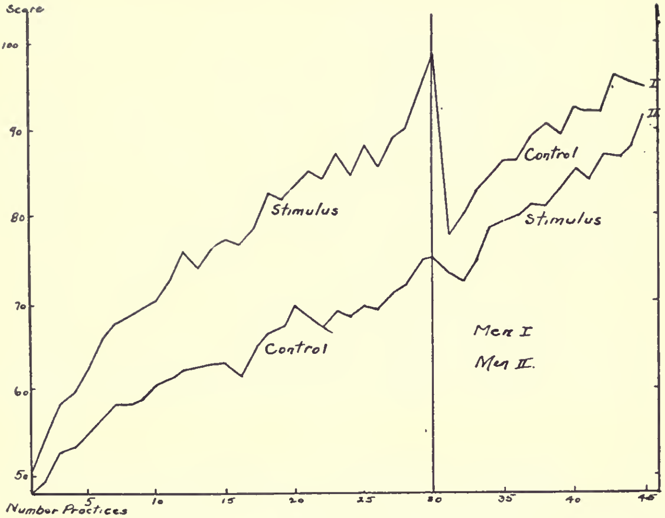

FIG. 7. LEARNING CURVES FOR MEN OF SECTIONS I AND II IN EXPERIMENT 2

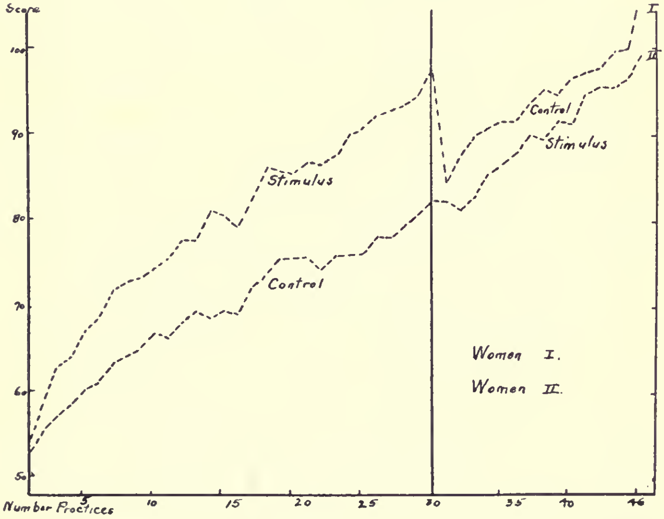

FIG. 8. LEARNING CURVES FOR WOMEN OF SECTIONS I AND II IN EXPERIMENT 2

and from remaining interested in the fact of their improvement while acting as a control group, the curves for all our experiments, particularly the second and fourth, show the same marked tendencies revealed by the curves for experiment 1. Every man and every woman in Section I of experiment 2, the stimulus group, made marked improvement in the first 30 tests. Many individuals more than doubled their initial score, while every man and every woman in Section II, now the control group, made proportionally less gain in the first 30 tests than did those belonging to our stimulus group. For the last 15 tests every man and all but two women belonging to Section II, now the stimulus group, made a decided gain over their best previous score, while Section I, as a whole and practically every man in it, lost ground during the last 15 tests. Some of the individuals in the section increased their score during the last 15 tests as much as 40 per cent (compare Figs. 5 to 8).

TABLE II. PER CENT OF IMPROVEMENT OR RELATIVE GAIN MADE BY STIMULUS AND CONTROL SECTIONS COMPARED

Experiment	*Groups*	*First two-thirds of practice*		*Last third of practice*[12]		*Total Gain %*		*Cases*	
		Men	*Women*	*Men*	*Women*	*Men*	*Women*	*Men*	*Women*
1	Section I	27.93	27.62	**15.67**	**12.03**	46.82	42.27	19	54
	" II	**35.38**	**33.34**	-12.18	-15.80	35.38	33.34	19	28
2	Section I	**93.53**	**80.65**	- 3.05	6.35	93.31	92.65	20	52
	" II	57.06	55.94	**21.88**	**20.10**	91.43	87.30	18	28
3	Section I	81.91	64.24	**38.77**	**40.02**	149.37	130.00	19	51
	" II	**73.24**	**74.56**	27.41	17.44	120.73	105.01	18	27
4	Section I	**434.07**	**498.26**	15.23	1.07	515.40	504.76	20	52
	" II	362.03	457.69	**28.91**	**19.83**	495.61	568.30	18	26

The relative amount of gain made by the stimulus and the control group in this second experiment is shown in Table II. From the data contained in this table it will be seen that Section I, which was exposed to our group of incentives for the first 30 tests, made a greater percentage of total gain for the entire practice than did Section II, which was exposed to this group of stimuli for only the last 15 practices. This same tendency was shown in experiment 4. The more rapid improvement of our stimulus groups over the gain made by the control group is shown in Figs. 7 and 8 by the spreading of the learning curves in the first two-thirds of the practice.

The composite curves (Figs. 13 to 16) for experiment 4 show in addition to the above results that the women belonging to Section I improved more rapidly during the first 30 tests,

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[12] Gain over highest record made in the first two-thirds of the practice.

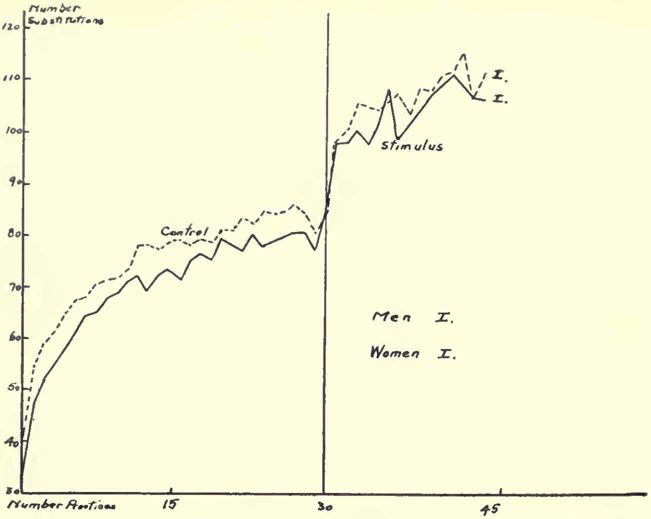

FIG. 9. LEARNING CURVES FOR MEN AND WOMEN OF SECTION I IN EXPERIMENT 3

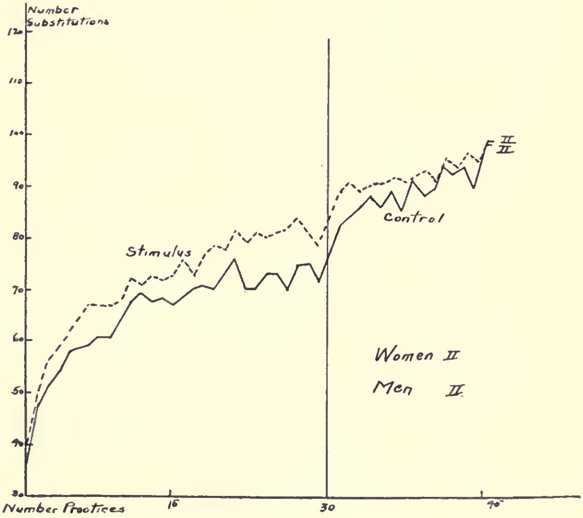

FIG. 10. LEARNING CURVES FOR MEN AND WOMEN OF SECTION II IN EXPERIMENT 3

when they were being specially interested in the fact of their improvement, than did the men under the same conditions. During the last 15 practices when they were kept ignorant of their score they made little improvement, 72 per cent of them failing even to reach the point of efficiency which they had attained at the close of the first 30 practices.

The men and women of Section II, on the other hand, improved more slowly during the first 30 tests, when they were not being specially interested in their improvement as such, than did the subjects of Section I, whom we tried especially to interest in the gains they were making and in the possibility of improvement. This is shown by the fact that the curves for both the men and the women belonging to this section pass below the curves for the stimulus group (Section I) for all the first 30 practices. But when the members of this group were informed at the beginning of the last 15 practices of their best previous score and urged to interest themselves in their improvement as such, their curves, which during all the 30 previous practices passed below the curve for the members of Section I, now rise rapidly above it, and remain so for the rest of the practice, reaching a point in the final practice above the best record made by members of Section I, and far above the best record made by the same section during their previous practices (see Fig. 15). The men of the control group in these last 15 practices, when taken as a whole, made a slight gain over the best record attained in the first 30 practices; the women fall much below it (compare Fig. 16).

And what is true in these experiments for the composite curves representing the average score of the sections taken as a whole is true for the individual learning curves also; 83 per cent of the men and 84 per cent of the women belonging to the control section in experiment 2 raised their scores very materially during the last 15 practices over and above the best score made in any of the previous 30 tests. For the sections which served first as a stimulus group the situation is just the reverse; 72 per cent of the women belonging to Section I failed during these last 15 practices even to reach the highest score made during the first 30 practices. And while the majority of the men (60 per cent) belonging to Section I made a slightly higher score during these last 15 practices than their best score in the first 30 tests, the group taken as a whole did not improve their score during this period of practice as much as did the men of the stimulus group.

The reason for this gain on the part of the men in the control group was revealed by their answers to the questions asked at the close of the experiment, which indicated the ex-

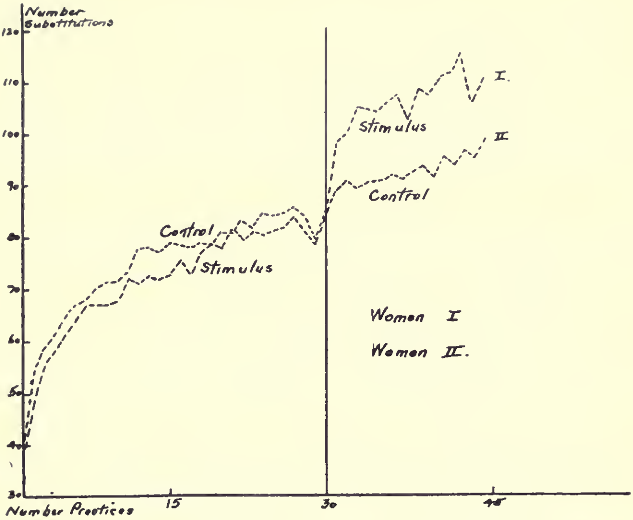

FIG. 11. LEARNING CURVES FOR WOMEN OF SECTIONS I AND II IN EXPERIMENT 3

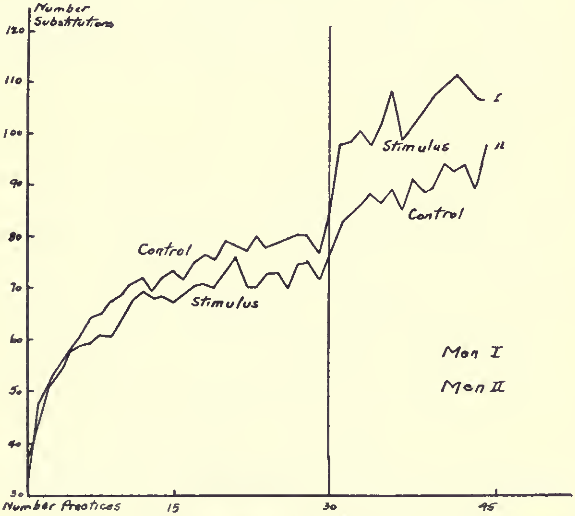

FIG. 12. LEARNING CURVES FOR MEN OF SECTIONS I AND II IN EXPERIMENT 3

tent to which they had succeeded in following the directions given them as members of the control group. A tabulation of their answers to these questions showed that 82 per cent of the men belonging to the control section stated that they could not help but be interested during these last 15 practices in the improvement they were making, while 75 per cent of the women stated that they had succeeded in banishing all thought of improvement from their minds during these last 15 practices.

The outstanding facts of the above comparison of the amount of improvement made by our several stimulus and control groups in the four types of learning studied are therefore the following:

1. The stimulus sections make more improvement with a given amount of practice than do the control groups. This is true for the groups taken as a whole, and for the individual records taken separately.

2. A stimulus group which has been making rapid and continuous improvement ceases suddenly to show such gains when our special group of incentives are removed.

3. A control group, on the other hand, which has been making little or no progress in the practice begins suddenly to improve and continues to gain more rapidly and consistently when definitely interested in its improvement as such and is made to feel that further improvement is possible.

4. It is significant also that these results hold not merely for the sections taken as a whole but for the men and women taken separately and for the record made by the individual subjects belonging to the various stimulus and control sections in the different experiments, and holds true for both the absolute and the relative amount of gain made in each type of acquisition studied.

5. It is further significant that the records of the stimulus sections contained fewer mistakes than did the records of the control sections, showing that the same groups of individuals not only ceased to gain in their score but also became more careless about their work when not interested in their improvement as such. But when they were subjected to the special group of incentives arranged in these experiments they began at once to increase both their output and their accuracy, as will be pointed out below.

(b) *Character and Rate of Improvement Made by the Various Stimulus and Control Groups*—1. With but two exceptions therefore the learning curves for all 16 stimulus groups rose more rapidly than did the curves for the corresponding control sections. This is shown by the spreading of the curves for

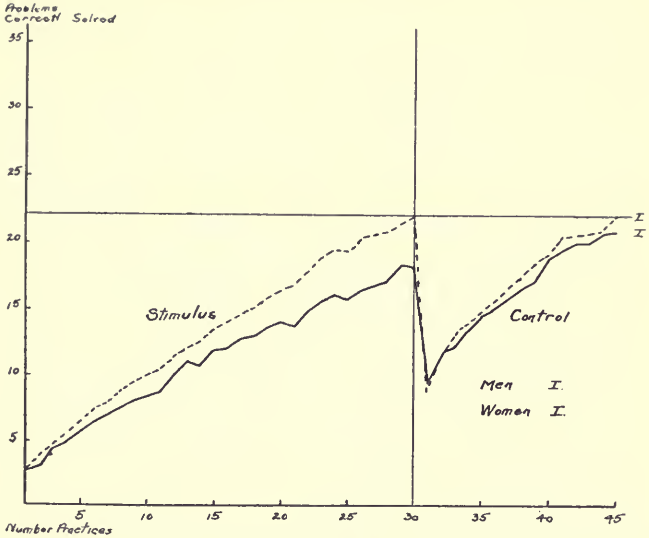

FIG. 13. LEARNING CURVES FOR MEN AND WOMEN OF SECTION I IN EXPERIMENT 4

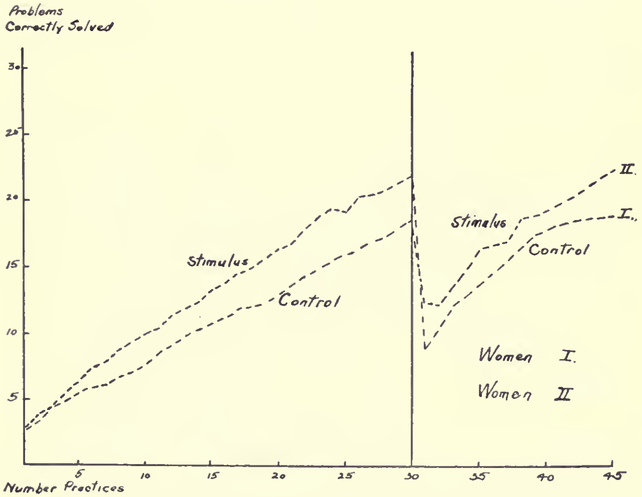

FIG. 14. LEARNING CURVES FOR MEN AND WOMEN OF SECTION II IN EXPERIMENT 4

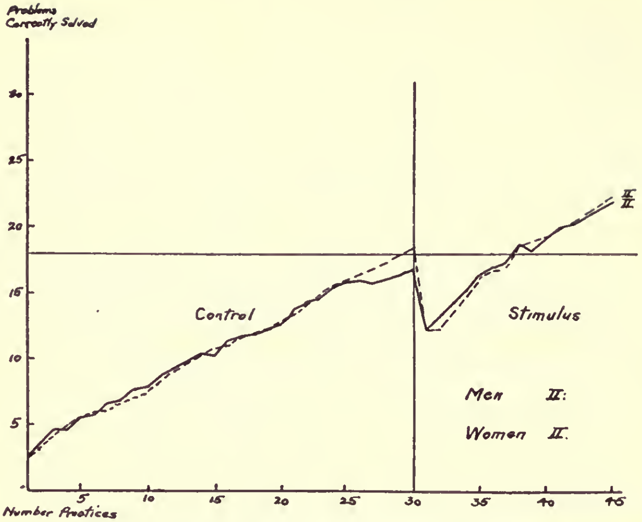

FIG. 15. LEARNING CURVES FOR MEN OF SECTIONS I AND II IN EXPERIMENT 4

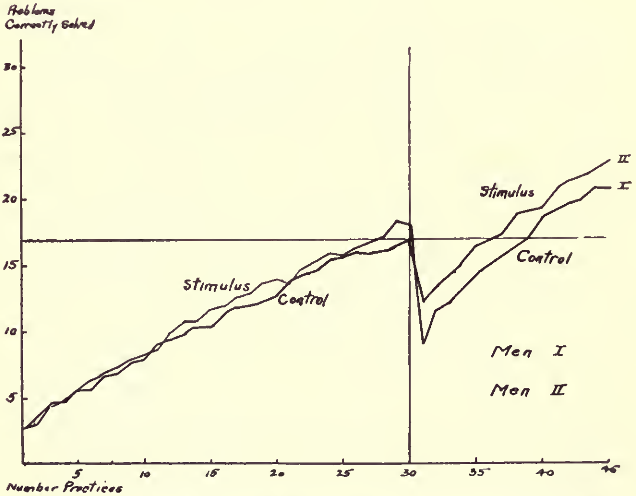

FIG. 16. LEARNING CURVES FOR WOMEN OF SECTIONS I AND II IN EXPERIMENT 4

the two groups as the practice proceeds and approaches the end of the tests (see especially Figs. 3 and 4, and 7 and 8). The exceptions come for the men of Section I in experiment 4 and for the women of Section II in experiment 3, and are explained by the fact that more than three-fourths of the subjects belonging to these sections stated that they were not able to follow the directions in their practice but remained interested in their improvement as such while practising as a control group.

2. There is also evidence in our results which shows that the majority of the subjects whose "will to learn" was especially appealed to were influenced in a definite way by the approaching end of the practice period. Figure 15 shows that the subjects of Section II whose desire for improvement was particularly appealed to during the last 15 practices made their highest record in the last three tests, while the women show a slump in effort and proficiency, for these practices. The same thing is true for the men of Section II in experiment 1 (see Figs. 2 and 3), who show a similar tendency as the end of the first 30 practices is approached. Here the curve for the section whose "will to learn" was being appealed to shows a sudden rise while the curve for the section which was kept ignorant of their score and asked to ignore their rate of improvement fails to rise in the last 4 or 5 practices.

In other words, the rate of gain is very materially increased for most of the stimulus groups in the last 3 or 4 practices. The control sections, on the other hand, do not seem to be influenced so much or at all by the approaching end of the practice. There is one marked exception to this rule, namely, the women belonging to the control section in experiment 2 (see Figs. 5 and 8). The men seem to be stimulated more by the approaching end of the practice than are the women.

3. The slump in the curves at the fifth test in experiment 1, for the men and women of both sections, is due to the fact that only 4 tests (20 practices) were given in this experiment during the first day of practice, 6 tests (30 practices) the second day, and 5 tests (25 practices) the last day (compare Figs. 1 and 2). The low record for the fifth test is therefore due to the fact that three days had intervened between the fourth and the fifth tests and that no warming-up practice was given for reviving the associations which had been but slightly formed in the previous practices, as was done in the three later experiments.

4. Another fact of interest, and one which throws much light on both the permanency and the character of the improvement made, is the fact that the stimulus sections made

on the whole fewer mistakes in their practice than did the members of our various control groups. No directions were given to the learners in regard to the attitude which they should assume towards mistakes except that they were given the general instruction to make their records correct and to work as fast as they could in each practice and test. That the stimulus groups not only improved more rapidly as a result of the practice but actually made fewer mistakes is an important result, for it made the progress more sure as well as more rapid, thereby showing an additional effect of the special group of incentives which we isolated for study in our experiments.

The average number of errors made per test by the various sections in each experiment and division of the practice is shown in Table III. The records for the stimulus groups are set in bold-faced type to make them more easily distinguishable from the average number of mistakes made by the control groups. No mistakes were counted in the first experiment, as already pointed out above.

TABLE III. AVERAGE NUMBER OF MISTAKES MADE BY EACH SUBJECT IN EACH TRIAL WHEN PRACTISING WITH A STIMULUS OR CONTROL GROUP

Experiment	*Section*	*Record for first two-thirds of practice*		*Record for last third of practice*	
		Men	*Women*	*Men*	*Women*
2	I	**1.93**	**1.04**	1.74	1.07
	II	.89	1.59	**.86**	**1.02**
3	I	.308	.103	**.237**	**.224**
	II	**.111**	**.120**	.144	.214
4	I	**2.33**	**2.32**	2.52	2.67
	II	2.25	2.86	2.24	2.43

5. But a fact of even greater significance than the decline in the number of mistakes is the fact that the individuals belonging to the various stimulus sections who possessed the highest initial ability (as indicated by their scores on the first test, or average score on the first three practices) show, on the whole, the greatest amount of improvement in the practice, while in the control sections these more capable individuals do not show this extra amount of gain. That is to say, the individuals who possess the highest initial ability of the type practised in any given experiment improve relatively more when they are being specially interested in their improvement than they do when practising as members of a control section. In other words, when a group of individuals are subjected to the special group of incentives arranged for our experiments

TABLE IV. SHOWING AVERAGE GAIN IN ABSOLUTE POINTS MADE BY MEN AND WOMEN WITH HIGHEST AND LOWEST INITIAL SCORE

EXPERIMENT I

	Section I				*Section II*			
Percentile Groups	*Highest 25*	*High 50*	*Low 50*	*Lowest 25*	*Highest 25*	*High 50*	*Low 50*	*Lowest 25*
Men								
First 50 Practices	68.5	85.2	74.6	106.5	**113.0**	**93.25**	**98.5**	**104.75**
	(76.8)		(90.5)		(103.1)		(101.6)	
Last 25 Practices	**31.5**	**39.8**	**65.8**	**74.0**	-38.0	-34.5	-24.0	-31.0
	(35.6)		(69.9)		(-36.2)		(-27.5)	
Total Gain	100.0	123.6	140.4	180.2	113.0	93.0	98.0	105.0
	(111.8)		(160.3)		(103)		(101)	
Women								
First 50 Practices	76.7	78.1	94.0	81.0	**85.6**	**108.0**	**101.0**	**94.4**
	(77.4)		(87.5)		(96.8)		(97.7)	
Last 25 Practices	**39.6**	**43.0**	**44.5**	**38.2**	42.0	48.0	26.0	24.0
	(41.3)		(41.8)		(45.0)		(25.0)	
Total Gain	116.3	121.0	138.4	112.3	86.0	108.0	101.0	94.0
	(118.6)		(125.3)		(97.)		(97.)	

EXPERIMENT II

Men								
First 50 Practices	**50.6**	**49.4**	**53.8**	**28.4**	27.0	29.0	31.0	30.4
	(50)		(46.1)		(28)		(30.5)	
Last 25 Practices	-2.6	-1.2	-.04	0.0	**16.75**	**11.2**	**19.8**	**15.5**
	(-1.9)		(-.02)		(13.97)		(17.75)	
Total Gain	54.2	51.2	57.6	44.2	43.75	40.2	50.8	45.5
	(52.7)		(50.9)		(41.8)		(48.2)	
Women								
First 30 Practices	**46.5**	**46.1**	**47.8**	**44.1**	34.9	36.3	31.1	25.3
	(46.2)		(45.9)		(35.6)		(28.2)	
Last 15 Practices	7.1	5.8	11.1	4.1	**13.0**	**18.2**	**13.7**	**19.8**
					(15.6)		(16.7)	
Total Gain	53.6	53.0	61.2	50.0	47.86	54.6	45.3	45.0
	(53.3)		(55.4)		(51.23)		(45.1)	

EXPERIMENT III

Men								
First 30 Practices	54.7	49.4	52.4	59.7	**44.0**	**47.0**	**40.0**	**48.0**
	(52.2)		(56.0)		(45.5)		(44.)	
Last 15 Practices	**27.5**	**27.0**	**21.2**	**32.8**	16.6	20.2	19.0	14.6
	(27.2)		(27.0)		(18.4)		(16.8)	
Total Gain	82.2	76.4	73.6	92.5	60.6	67.2	59.0	62.8
	(79.3)		(83.0)		(63.9)		(60.9)	
Women								
First 30 Practices	46.5	46.0	48.1	51.0	**46.4**	**58.0**	**49.2**	**49.7**
	(46.2)		(49.5)		(52.2)		(49.4)	
Last 15 Practices	**26.0**	**32.0**	**26.7**	**21.4**	15.9	11.4	16.6	9.8
	(29)		(24.1)		(13.5)		(13.2)	
Total Gain	72.2	77.9	74.7	72.4	62.0	68.8	64.3	59.5
	(75.0)		(73.5)		(65.4)		(62.9)	

the brightest individuals in that line to begin with show the most relative gain. But when the same group of individuals are subjected to the opposite set of conditions the individuals who possess the lowest initial ability show on the whole the greatest amount of gain. There are only a few exceptions to this general rule, as may be seen by an examination of the data contained in Table IV. The total gain made by the various percentile groups in experiment 4 figured by a different method shows the same thing (compare figures given in Table V).

This per cent of gain for the members of our several stimulus and control groups was figured in two ways. For experiments 1, 2 and 3 the relative gain made by the several percentile groups was determined by ascertaining the per cent of improvement which these various groups of individuals made in each experiment and comparing the relative gain made when they served as a stimulus group with the record made by corresponding percentile groups in the control sections. For experiment 4 the gain made by the various groups for the entire practice was figured as follows: Each of our 124 subjects was given at the close of the 45 practices an entirely new group of problems of the same degree of difficulty as the problems used in the regular experiment. Three extra practices were then given with this new material, under the same conditions maintained in the regular practice, save that both sections in these final practices were required to keep track of their score. The average score made in the first three tests of the regular experiment was then computed for each subject and compared with the average score made on these final three tests. It was believed that this would give a clearer indication of the actual amount of improvement that each subject had made in his ability to deal with the purely mental processes involved (i. e., imaging the numbers, holding them in mind until the necessary combinations could be made for final record) than the method of determining the total relative gain used for experiments 1, 2 and 3.

In this manner the average score made by each subject in the first three practices and the average score made in the three special practices given at the end of the experiment were compared and the absolute amount of gain, in problems correctly solved, determined for each individual and section. These individual scores were then arranged beginning with the subject which made the lowest initial score to the case making the highest initial score and placing opposite each name and average initial score the average number of problems correctly solved by the subject in the last three special practices. The average gain was then computed for the various percentile groups of men and women belonging to each section. These results are presented in Table V and show that the individuals of every section save one who made the lowest initial score in this type of learning showed also the least amount of absolute gain in their practice, while the individuals, on the contrary, who made the best initial score in this experiment made the greatest amount of improvement in the practice. The one exception is the girls of Section II. It is also worthy of special mention that both the men and the women of Section I who were subjected to our special group of incentives for two-thirds of their practice, i. e., who served as our main stimulus group, showed the highest increase in improvement for the more capable individuals belonging to the section, that is, for the seventy-five percentile group.

TABLE V. ABSOLUTE GAIN MADE BY DIFFERENT PERCENTILE GROUPS IN ENTIRE PRACTICE OF FOURTH EXPERIMENT

Average improvement made by	*Lowest 25 percentile*	*Next 25 percentile*	*75 percentile*	*Highest 25 percentile*
Section II—Men	2.14	3.14	4.52	4.46
Section II—Women	4.09	2.63	3.88	3.99
Section I—Men	3.30	3.26	3.50	5.56
Section I—Women	3.15	3.17	4.17	4.74

6. This method of calculating the total amount of absolute gain revealed still another probable effect of the special conditions arranged for the learners in this fourth experiment, namely: both the men and the women belonging to Section I who were thus stimulated during the first 30 tests made more total relative gain in the group of mental functions involved in mentally multiplying one two-place number by another than did the men and women belonging to Section II, who were subjected to this group of incentives for only the last 15 practices. This is true for the men and women taken together or separately, as is shown in the following table giving the per cent of gain made in the entire practice by the members of Sections I and II in experiment 4.

Groups	*Section I*	*Section II*
Men	111.5%	105.6%
Women	110.1	106.4

7. The amount of gain made during these 45 practices is also significant. As the table shows, the members of each section and sex group more than doubled, on the average, their initial ability to deal successfully with the mental problems presented in this type of learning. That those whose "will to learn" had been especially appealed to during two-

thirds of the total practice should increase their total efficiency in this line more than those who were exposed to this group of incentives for only one-third of their total practice is significant especially when taken in conjunction with the results already presented in Figs. 1 to 16.[13]

(c) *Individual and Sex Differences*—As was shown in section (a) above, most of the individual curves follow, in each type of learning, the same general course as the composite curves for the various stimulus and control groups taken as a whole. Some marked and important individual differences were found, however, not merely in *initial ability* of the type called for by our several experiments and in the *amount* and *character of the improvement* that was made as a result of the practice, but also in the way in which different individuals reacted to the group of special incentives that were arranged in the several experiments.

(1) *Individual Differences Shown*—Some idea in regard to the range in initial ability and the variations in the absolute amount of improvement made by different individuals in each of our sections and sex groups may be obtained from the data given in Table VI, which shows the total range in initial and final score for these several groups in experiments 1, 2 and 3. About the same range in ability was shown in experiment 4 and by the relative improvement that was made in each experiment. The latter was worked out for three of our experiments, but as it showed no new facts was not determined for the fourth or included in the table. The table shows a greater range in both initial ability and in improvement for the girls than for the boys.

TABLE VI. INDIVIDUAL DIFFERENCES

RANGE OF VARIATIONS SHOWN AT BEGINNING, END AND AT VARIOUS STAGES OF PRACTICE

	Variations in initial score		*Gain in first 30 tests*		*Highest score made in practice*		*Gain in last 15 tests*		*Total or absolute gain*	
	Men	*Women*	*Men*	*Women*	*Men*	*Women*	*Men*	*Women*	*Men*	*Women*
Experiment I										
Sect. I										
Lowest	235	206	52	39	360	280	**5**	**12**	72	60
Median	277	272	72	87	411	402	**54**	**41**	154	118
Highest	321	333	159	140	444	487	**101**	**98**	201	217

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[13] This result, obtained also in experiment 2, was not obtained in experiments 1 and 3, where Section II was subjected to our special group of incentives for the first two-thirds of the practice. It may, therefore, be due not to the influence of the "will to learn" but to a greater capacity to improve by practice on the part of the members of Section I over the learning ability of the members belonging to Section II.

Sect. II										
Lowest	209	229	**71**	**62**	311	318	-11	-7	71	62
Median	274	289	**89**	**96**	371	375	-30	-38	89	96
Highest	362	345	**160**	**162**	482	452	-67	-87	160	162
Experiment 2										
Sect. I										
Lowest	39	42	**27**	**25**	74	83	-15	-34	30	28
Median	48	51	**46**	**48**	100	102	-2	5	54	55
Highest	92	92	**70**	**75**	132	149	19	41	72	100
Sect. II										
Lowest	33	40	11	14	70	75	**11**	**7**	20	26
Median	47	50	30	30	93	92	**18**	**16**	47	48
Highest	72	87	43	55	120	140	**26**	**41**	64	80
Experiment 3										
Sect. I										
Lowest	28	25	30	22	87	83	**6**	**8**	49	39
Median	35	44	55	51	114	115	**27**	**25**	83	71
Highest	47	56	77	73	162	166	**40**	**44**	117	110
Sect. II										
Lowest	24	18	**25**	**20**	67	65	-1	0	32	35
Median	35	40	**46**	**49**	100	102	17	14	65	63
Highest	60	60	**67**	**80**	129	141	35	25	89	101

In regard to variations in the degree of susceptibility which different individuals showed to the special incentives arranged for the various stimulus groups the following facts should be emphasized:

1. All of our subjects seemed to be intensely interested in all the experiments. But the record and behavior of some individuals in the practice seemed very erratic and unstable, while the record of others showed a steady increase in score, some rapid, others a steady but slower gain.
2. Some individual records and curves give evidence of being influenced very decidedly, consistently and successfully by the group of incentives used upon our stimulus groups. Others were not influenced much, if at all, by these incentives. They could not be made interested in their improvement as such and took the tests more as a matter of course. In certain experiments some individuals were even influenced adversely by the directions which we gave them and by the intense interest which was awakened in their improvement and score. This was particularly true for many individuals in the stimulus sections of experiment 3. In fact in all of the last 3 experiments some subjects became for a part or all of the practice so much interested in the fact or desire for improvement that they focussed their attention *on the improvement as such* instead of on the details of the task which was to be performed or on the *means* required to bring about

the desired improvement. As a result their record in particular practices and their total improvement was interfered with. In other words, by trying to go too fast they lost control over their work and the *means* of improvement for a part or all of the practice. A few individuals in both sections seemed so unstable in their nervous make-up that no incentive we were able to give them would continue to operate steadily for more than a few practices at a time, while others seemed to be permanently influenced or set as it were in the right direction for the entire practice by this same set of directions and incentives.

These facts, and others too carelessly observed in the course of our experiments to be tabulated and reported, throw much light on the nature of the learning processes involved in our several experiments and upon the question of proper incentives in learning. The results obtained in the more complicated types of acquisition involved in experiments 3 and 4 show, among other things, that many individual students need in addition to having their interest aroused in their own improvement and in its possibility, to be shown exactly how to proceed to make such gains. That is to say, they must be shown exactly what to do or be given the kind of help which will enable them to direct their energies in a way that will make their practice more successful and efficient. This much is certain, the mere determination to improve and the belief that such improvement is possible must be accompanied by a determination to find the right means of bringing it about. The brighter subjects discovered these ways for themselves when subjected to the proper incentives and when they were confronted by the problem. But for other individuals the group of special incentives arranged in our experiments were not sufficient to insure such gains. Our special group of incentives were only effective when they succeeded in arousing a genuine interest in improvement, which later led the subject to discover for himself the improved methods of reacting to the concrete situations which the learning presented. A careful study of the individual records and errors made in our experiments, when considered in relation to our total results, indicate very clearly that, as the learning in our experiments became more complex, the special group of factors studied in our experiments could not be relied upon implicitly to bring about the desired improvement in all individual cases because some individuals were not influenced so much by these special factors as others and many gave unmistakable evidence of the fact that they needed additional help in the more complicated types of learning to make the right adaptations, and so to make their improvement continuous.

3. Some individuals got so interested in their rate of improvement during the stimulus practices that they carried over the interest and enthusiasm gained in these tests to the control practice and there kept track of their score in every way they possibly could, contrary to the directions given them as members of a control group. The evidence for this statement was contained in their individual curves which, contrary to the general rule, continued to rise rapidly and continuously during these control practices; also by the fact that their results improved in accuracy while the large majority of their classmates were dropping behind in both their score and its accuracy. That this was the case is further shown by the special data which we obtained from each subject at the close of the last two experiments. In practically every such case the answers to the questions given at the close of the last two experiments revealed the fact that these individuals had kept track of their score and had remained interested in their improvement as such during these practices. In the first experiment where conditions were perfectly controlled for our control sections and where none of our subjects knew all the conditions of our experiments not a single individual in the control groups made any gain during the last third of the practice and only a slight gain during the first two-thirds of the practice.

(2) *Sex Differences*—It is perhaps also important to point out that the men and women were influenced somewhat differently by the group of incentives imposed by our experiments and gave evidence of real sex differences in their initial and final ability to react to the problems presented in the several experiments. The following facts bearing upon these differences are most striking and significant.

1. The men seem to be influenced more by the group of incentives arranged in our experiments. That is to say, the men in our stimulus groups made more total and relative gain than did the women of corresponding sections. The per cent of relative gain due to the "will to learn" operating upon the men and women of the stimulus groups is as follows for the first two-thirds of the practice:

Experiment	*Men*	*Women*
1	26.3	20.7
2	60.0	44.1
3	10.4	16.0
4	19.9	8.9

(See also Table II, showing per cent of gain made by men and women in the different periods of practice.) The men seemed also to be more influenced by the approaching end of the practice, their learning curves showing a sudden upward bound in the last three or four practices of the experiment, not shown by the curves for the women of corresponding groups (see especially Figs. 4 and 15). The women show a greater range or variation in initial ability and in improvement.

2. The men in each stimulus group for every experiment save one made more absolute improvement than did the women. In the fourth experiment the women made more absolute gain than did the men, while in the first experiment, which involved rapid and accurate muscular co-ordinations, the men not only improved more rapidly than the women, but showed both a higher initial and final score in this type of performance. In experiment 2 the absolute gain made by the sexes was about equal (compare curves in Figs. 5 to 12). But relatively the men make more gains than do the women (for total per cent of improvement made by each sex in the several experiments, see Table II).

3. The men of Section II made fewer errors in each experiment than did the women of the corresponding section, which, if taken together with the fact of their relatively greater total improvement (compare data in Table II) and their greater susceptibility to our group of incentives as evidenced by their more steady and consistent gains in the stimulus groups, takes on a peculiar significance.

2. *Sources of the Improvement or Gain in Output Made in the Several Experiments*—But a question of as much or more theoretical and practical significance as the fact that this special group of incentives does have a direct measurable effect upon the rate and amount of improvement which a given amount of practice will produce is the problem of determining the factors in each case of learning which make this gain possible and ascertaining the exact avenues through which this improvement comes. In no other way shall we be able to see just *how or why* these increases in score were made under the influence of this special group of incentives. And unless such qualitative studies in all specific instances of learning are made we shall be but little wiser when it comes to the solution of the practical problem of giving proper direction to the learning activities of children and adults in the schools.

To take a concrete example from the many scores of studies that are now being made of reading, it may be pointed out that it will not suffice to measure the progress which learners make under different sets of conditions of study, or to work out elaborate chains of correlation between different phases of the learning process, no matter how interesting or suggestive such attempts at studying the problem of "learning to read" may be. To make a thorough and accurate study of learning to read we must, in addition to measuring the actual progress that is made under different conditions of learning and sets of incentives, determine just what an individual who is confronted by the problem of "*learning to read*" the vernacular must actually do. We must determine the exact responses or habits which he must acquire in learning to read and ascertain further just how these habits are formed and perfected as the learning proceeds as well as determine the conditions that arise in the course of the learning which hinder or aid the learner in forming and perfecting, for more rapid and accurate use, these particular physiological and mental responses. Only such *qualitative* studies as these can reveal just *how* and *why* the improvement which we measure is made, and they must be made before we shall be able intelligently to direct the activities of the learner in a beneficial way.

(a) *Elements of Gain in Our Several Experiments*—It was not the purpose of this investigation to discover and describe the factors which are responsible for the gains that were made in each type of acquisition which we studied, but to determine whether or not added improvement would occur under the special set of conditions imposed in our experiments and to determine to what extent this "will to learn" would increase the *gain* which a given amount of practice might produce. But in the judgment of the writer the problem of determining the exact elements which are responsible for the improvement itself is of more practical and theoretical importance in any study of learning than that of measuring the amount of improvement that is actually made. Any thorough study of acquisition or learning in any field should therefore involve such a *qualitative* study as we have suggested as well as a quantitative one. Every learning study should determine the actual sources of the gain which is made or describe the specific habits which are formed to account for the increase in skill. It should also determine, if at all possible, the channels through which this improvement comes or ascertain and describe exactly how these necessary habits are formed and perfected as the learning takes place.

To have done this for each of our types of acquisition would have required a special technique which we did not and could not employ in our experiments. Nevertheless a number of important facts bearing on both these problems were determined in the course of the experiment for each type of acquisition studied. It may in the first place be definitely said that each experiment presented a definite case of learning. That is to say, the procedure in our several experiments did not merely consist of doing the task set in a definite way and learning to do it in this fixed way always more accurately and quickly. Each experiment presented a case of genuine learning, the acquisition in the later experiments being more complicated and complex than in experiment 1. But even in experiment 1 many opportunities were presented to the subjects for the invention and use of new and better methods of control as the practice proceeded. For example, most subjects unconsciously learned in our first experiment, under the stress of increasing their speed, to make the letter "a" in rhythmic fashion, making it three or four letters at a time, thus facilitating greatly the matter of initiating and controlling the three separate movements required to make each letter. They also learned better how to hold their papers, the most advantageous size of letter for them to make, the length of line to make, how to hold and grip their pencil for such quick and continuous work, etc.

That many such improved methods of control were actually invented and used by our stimulus groups was indicated not merely by the observations of the learners who volunteered much valuable information bearing on this point, but by two sets of practice curves obtained from five special subjects who took 100 practices each in making both the letter "a" and the figure "4," when the method for our experiment was being worked out and tested. The problem in these preliminary experiments was to make the small letter "a" and the figure "4" as rapidly as possible for 30 seconds. Fifty practices were taken without a knowledge of score or interest in improvement, alternated with 50 practice periods in which the subjects knew their score and rate of improvement. The curves representing the practices where the subject's "will to learn" was thus appealed to proved to be typical learning curves in four out of the five cases. All five subjects improved their rate during the stimulus practice. But the curves for the control practices showed no improvement whatever, even a slight decline after the first 10 or 15 trials (compare Fig. 17, which is typical).

In experiments 2, 3 and 4 still greater opportunities were presented for the discovery and development of better methods of controlling the situations presented by the problem of learning, as the practice progressed. Just what these elements of improvement are, we made no *special* attempt to determine,

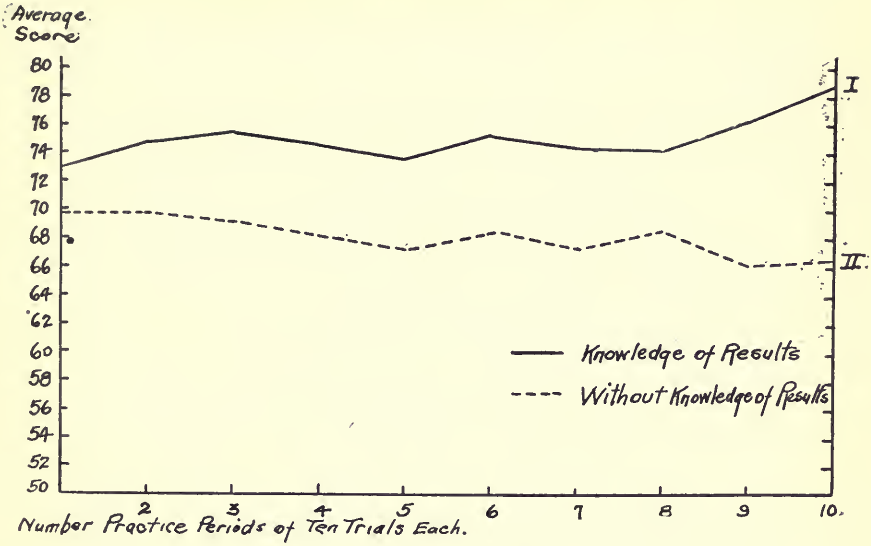

FIG. 17. TYPICAL PRACTICE CURVES SHOWING EFFECT UPON THE SCORE OF INTEREST IN IMPROVEMENT WHEN ONE HUNDRED PRACTICES WERE GIVEN ALTERNATELY WITH A KNOWLEDGE OF THE SCORE (I) AND WITHOUT A KNOWLEDGE OF THE SCORE (II)

as this problem fell outside the purpose of our investigation and method; but as was stated above, a complete study of learning should determine and describe the exact factors which account for the rate and amount of improvement which is being made, and so determine just how these forward steps in the learning are actually brought about in the course of the practice, even describing the exact channels through which the improvement comes. The importance of this group of factors was especially emphasized in the present experiments by the fact that many individuals in all our stimulus groups did not unaided discover these improved methods of control for themselves, indicating that for the more complex types of acquisition, at least, special guidance is needed in addition to furnishing the special incentives studied in this investigation or interesting the learners in the fact and possibility of their improvement as such.

b. *Channels through Which the Improvement in our Several Experiments Came*—That improved methods of control for each type of learning were actually invented by our learners in the course of the practice has just been pointed out. But a fact of even greater importance than the fact of its occurrence is the question of *how* and *why* interest in improvement as such and faith in its possibility should help to bring it about. In order to understand the exact channels through which this improvement came or how the new and higher methods of control came to be invented and used by the learners under the conditions of our experiments the following facts should be kept in mind: (1) All stimulus sections increased their output in each experiment more than did the control groups.[14] (2) In the experiments where the subjects were most completely exposed to this set of conditions we obtained the greatest effect. (3) In some experiments the stimulus sections, which were subjected to this set of conditions for the longest period of time, made the most improvement. (4) The stimulus sections which made the most rapid gain were also more accurate in their work. (5) It was in practically every stimulus group the brightest students, i. e., those who made the highest initial score, who made the most improvement. That is to say, these abler students seem to have been influenced most by our group of incentives.

Just why the members of these stimulus groups succeeded better in initiating and selecting the more efficient methods of control than did the members of our control groups and how these new and better methods of work came to be employed in the first place was not determined in *detail* in our experiments, but the following facts throw considerable light on the questions involved:

1. There is evidence in our data to show that this interest in improvement and faith in its possibility made the learner's effort more steady, consistent and even intense. That is to say, more energy seemed to be released and in a more steady stream. In the words of one subject, "It seemed to come more of itself and could be directed more easily and consistently upon the proper details of the work." Some individuals, to be sure, were not affected in this way, as has already been pointed out; but the majority of them were.

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[14] One is tempted to try to make a quantitative statement showing the exact value of the "will to learn" for our several stimulus groups, but such quantitative statements are apt to be misleading at best; and the fact that our standards of measurement in the different experiments were of unequal value makes it difficult to make such a statement for our data. But it seems altogether possible to devise a method whereby such a quantitative value for the "will to learn" might be accurately determined for all or most types of learning. Future investigators should at least keep this problem in mind, as it would be exceedingly valuable to know whether or not this factor has a specific and rather constant value for acquisition or whether it depends for its degree of effectiveness upon the type of learning, the disposition of the learner and other factors which help to determine its effect upon improvement. It would be interesting and decidedly worth while to know.

2. This more steady and intensive application of effort to the work in hand made it easier to avoid mistakes and to vary the reactions in ways that naturally called forth the new and better methods of control which, because of their greater success and pleasantness, came regularly to be selected by the learner.

3. This increased success and the greater ease with which the psycho-physical processes involved worked, also gave rise to a more favorable feeling tone which through the operation of the law of effect facilitated for the learner the release of still more energy, which, coming as it did quite spontaneously, tended to flow more easily and surely in the right direction. That is to say, the agreeable feeling tone made it easier for the learner to apply himself more efficiently to his tasks because his energies flowed not only more freely but more spontaneously and easily in the right direction.

4. This excessive energy correctly and consistently applied to the details of the work plus the accompanying favorable feeling tone, when thus coupled with a genuine desire to improve and a firm belief in its possibility, seem also to constitute a more favorable condition for making helpful variations in the physiological and mental responses which furnish the stuff from which the new habits or adaptations in method are made which give the learners their better methods of control, and which, therefore, constitute the real factors of gain in output shown by our objective results. It is the formation and use of these higher methods of control which make the improvement possible; and for the initiation and development of these higher methods of control a genuine interest in improvement as such and an abiding belief in its possibility seem to be a necessary condition, though it by no means follows that such a sheer interest in improvement will bring it about directly or at once. For as already pointed out, many of our learners were temporarily hindered if the thought of gain occupied too prominent a place in their minds while they worked. But if persisted in, it would doubtless eventually lead to the necessary adaptations in method by all normal subjects. It should, however, be remembered that many of our individual learning curves strongly suggest that many individuals must be given definite directions and help, in addition to the special incentives studied in this investigation. Such help, if rightly given, would also prevent much needless experimenting in the case of *all* subjects. That such specific help cannot now be given in any specific case of learning is due to the fact that the process of learning has not been *qualitatively* studied or sufficiently *analyzed* to enable us to

determine the exact kind and amount of help that must be given to make the learning economical and efficient. These and other means of improvement will be discussed in the following section, which is devoted to a more theoretical interpretation and discussion of our results.

IV. Interpretation and Discussion of Results

In the sections which precede we have given little more than a bare statement of our problem, method and results. In the discussion of these results, we desire first of all to interpret the specific facts which were determined in these experiments, but we shall in addition try to point out a wider circle of interpretation for which our data are not made out. We have, however, no special interest in these suggestions or in any explanations here made, further than to see them subjected to further experimentation and their validity established or disproved by the facts.

1. *Why Interest in Improvement and Belief in its Possibility Help To Bring It About*—This study and our exact measurement of the output of 124 subjects in four widely different types of learning give objective evidence or proof for suggestions that have often been made concerning the dynamic and helpful effect for learning of a vivid and constant interest in one's success as such and of an abiding faith in one's own ability to increase his skill in that particular line. All members of our stimulus sections not only improved more rapidly than did the sections of our several control groups, but they became more accurate as well, while the same individuals in the same type of learning ceased to improve and became more careless about their performance when this group of incentives was removed and all other conditions were kept uniform. That such an interest in improvement and a belief in its possibility are directly helpful in producing such gains in learning has long been believed. Our results make it a fact for at least four simple but widely different types of acquisition.

The explanation of these results raises the whole question of the psychology of ideals and purposes, and the practical significance for learning and achievement of faith and belief. Such being the case, or at least appearing to be the case, we feel wholly incompetent to give an exact interpretation of these results, because it was not the purpose of this investigation to ascertain the specific channels through which this improvement came or to determine specifically just how it was induced in our several experiments. Nevertheless, some discussion of the "how" and the "why" of this marked improvement should be attempted, and it is hoped that the following interpretations will prove suggestive and helpful. But for a complete and verified statement of just *how* and *why* such results are obtained we must depend upon future *qualitative* studies which will be necessary to explain these and other important theoretical and practical questions raised by our results.

As already shown, the progress made by our subjects in the several types of acquisition studied did not consist merely of doing the task set in each experiment in a definite way and learning to do it in that fixed way always more easily and quickly. Each experiment presented a genuine case of learning where old methods of control were being outgrown and left behind as new and more economical and efficient methods of dealing with that situation were formed and perfected as the practice continued. Our problem, therefore, becomes one of pointing out how our special group of incentives aided the learners in *initiating*, *selecting* and *fixating* these more efficient methods of control developed by our several stimulus groups. If such new and more economical habits were developed in the course of the practice they had of course somehow to be (1) initiated or performed a first time, and (2) to be definitely selected or given enough prepotency to get themselves repeated, while the older and less efficient habits are left behind, and (3) they had to be repeated often enough to get the newly formed habit mechanized as a new mode of response to the situations which the problem of learning presented. How do interest in improvement as such and faith in its possibility aid in the solution of these specific problems? No complete answer can be given, for reasons already stated, and others that will readily suggest themselves to the reader. But the following suggestions seem warranted by our data and are offered as the most likely interpretation that can be given in the light of our own data and the results obtained in other studies of the learning process.

(*a*) *Interest in Improvement Served as a Directive Force in Our Experiments.*

1. It is clear in the first place that in our particular experiments the learners' interest in their improvement and the desire for further and continuous gain which we aroused in our stimulus groups made the learners keep closer track of their procedure and score. The fact that they were required to keep track of their score gave them a definite method for determining the cause of their success or lack of success, as the case might be. This aided in the selection of any new and more economical method of control which might be accidentally or otherwise originated in the course of the practice because of the

varied responses that were induced by the desire for such improvement. By thus making them directly aware of their failure and gain, the learners were enabled to ascertain not only the things which brought about success but to note the things which caused failure. It therefore indicated to them the direction in which to vary their psycho-physical responses to perform the task always more quickly and well, and aided them in initiating and selecting the better methods of control, which the desire to succeed brought on quite naturally through the process of varying the reactions of the learners in all possible ways or until such a more direct, economic and successful response to the situation presented by the task of learning was called forth. It also helped to eliminate, by heightening the unpleasant effect which they produced, the psycho-physical responses that were wrong and that did not further facilitate the tasks which the learning presented. Both types of response are about equally often called forth in the natural course of all such cases of undirected human learning as those required in our experiments. Without this interest in improvement as such and an *exact knowledge of the results* a *wrong* or *inefficient* method of response may be formed and practised until fixed as a set type of reaction to the task imposed by the learning,[15] or the learner may continue to respond by methods of control which succeed but which do not constitute the type of response that is used by the expert. The learner simply becomes satisfied with a method of control that is successful but far too slow for the highest type of performance that is possible for him to attain. *With* a knowledge of his score and interest in his own improvement coupled with a confidence in his ability to make further gains in that field such wrong habits cannot be formed or fixed, because all wrong and inefficient habits accidentally formed in the course of the learning will be promptly eliminated and the learner's responses varied indefinitely or until a better method of control is initiated and selected. The old adage "Where there is a will there is a way" simply meant in our experiments that if a learner really believed *that there was a way* and was sufficiently interested in finding it he would somehow discover and use that way for himself. Without this interest and belief the thing simply does not and perhaps cannot happen.

For all this a knowledge of one's score and an awareness of the improvement or failure which is actually taking place are a helpful condition. It shows the amount and quality of the *defect* which is to be overcome, because the learner is encouraged to compare his record of achievement with a real standard. It may also indicate the direction in which improvement must be sought and so help to bring it about by controlling the variability of the new responses. What is needed in future studies of learning is a more detailed and accurate determination of the exact ways in which the forward steps in *all* fundamental types of learning are actually brought about so that the process of learning may be more efficiently *directed* and thereby made more economic and secure. Until this has been done for all important types of learning, the learners must proceed *undirected* or with such direction as our rough trial and error methods in education now enable us to give. Until this shall have been done the mere desire for improvement and a firm and steadfast belief in its possibility will continue to be of vast practical importance to all learners who must be *their own directors* and therefore proceed in the business of learning by the trial and error method.

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[15] See article by C. H. Judd, "Practice without Knowledge of Results," *Psych. Rev. Mon.*, Supplement VII, 1905, p. 185-98. Also C. H. Judd, "Practice and Its Effects in Perception of Illusions," *Psych. Rev.*, IX 1902, p. 27-39.

2. But this "will to learn" and interest in improvement direct the learner in still another way. They bring into operation the law of effect, and make it possible for this law to operate in forming and mechanizing the more economical habits of control to be formed. The intense desire for improvement as such which we aroused in our stimulus groups made the attainment of this goal intensely pleasurable and every reaction which impeded this progress displeasing. This made it possible for the law to operate in a direct and helpful way by further stimulating all the activities (mental and physical) which brought about success, because these would certainly be felt to be pleasant to one keenly interested in improvement as such, and by eliminating all responses that led to failure, for the same reasons. In other words, by directly interesting our subjects in the fact of their improvement, and by our method of accurate measurement which revealed to them when and how much gain they were making, we made a successful appeal to one of the most compelling and deep-seated laws of living organisms which in its more primitive and harsher aspects we call fear, hunger, pleasure or pain, and which remains not merely the controller and director of the general activities of living organisms but is one of the compelling directors of the whole process of learning as such. Without a knowledge of one's score and an intense interest in one's improvement as such this law cannot operate.[16]

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[16] Compare on this point an article by Harvey Carr, "Principles of Selection in Animal Learning," *Psych. Rev.*, Vol. 21, 1914, p. 157-68.

(*b.*) *Interest in Improvement and Belief in Its Possibility Aid Mental Adaptation and the Formation of New and Better Methods of Work*—But what is perhaps still more important for attaining the highest success in learning and for explaining the results which we obtained in our experiments is the intensity and persistency with which this idea of success is held in mind and the consistency with which the learner works under its guiding influence. An exact knowledge of one's score not only indicates the quality and character of the defect which must be overcome by the learner but gives a definite standard with which the learner may compare his achievement. If now he is genuinely interested in making further gains and believes that this is possible for him he puts more energy into the work. In other words, the character of his interest in improvement as such and his belief in its possibility determine the intensity and persistency with which this idea of success is held in mind, the intensity and persistence of this idea help to determine the kind and amount of effort which the learner puts into the practice. There is much evidence in our data which shows that this desire for improvement, when coupled with a belief in its possibility, enabled the learners to release not only *more* energy but to direct it more easily and readily towards the right details of the work. In other words, under the influence of this special group of incentives the learner was able to call forth the best effort of which he was capable and to do it more easily and consistently and therefore to practise the performance always on the highest plane yet attained. This enabled him to practise and fix the highest order of habits which he had thus far developed, a phase of the learning process which was found to be an essential condition of the acquisition of skill in learning to use a typewriter.[17] Without it the learner simply settled down on a plane of writing far below the limits of his best performance, and continued the practise, quite successfully to be sure, but with the use of habits of control far less economical and slower than those used by the subject at his best periods of work. Some of the plateaus in these earlier learning curves were caused by the fact that the learners did not put forth enough effort to keep themselves practising always with the highest method of control which they had thus far been able to use, but were content to use a slower method of control, one developed and used in the earlier stages of the practise. In a word, they failed to push themselves along to the point where the more economical methods of control would be invented.

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[17] Compare Book, W. F., "The Psychology of Skill," *Univ. of Montana Studies in Psych.*, No. 1, 1908, see p. 159-66.

Intense and steady interest in improvement when coupled with a confidence in the possibility of further and continuous gain such as we instilled in the minds of our stimulus groups, therefore, not only keeps the learners practising with the highest method of control which they had yet discovered and used, but makes them vary their reactions more and more as the practise progresses, under the impelling force of this "will to learn." It was this set of conditions which enabled and forced them to initiate the new and more favorable adaptations in method that made the reactions of our learners to the performance of the task always more economical and rapid. In this manner did the group of special incentives arranged in our experiments lead to the invention of new methods of control and to the selection[18] and practise of those modes of response which proved to be most economical and efficient for the tasks which the learning presented. Without this extra effort *consistently* and *persistently* applied these new and better methods of control were not brought into play, or if originated they simply remained hidden from the learner because he was content to do the work in the slower and less economical ways already learned.

It is in some such manner as this that our group of special incentives helped the learners to overcome the more elemental and inefficient methods of control that were used in the earliest stages of practice and to conquer the many special difficulties which each case of learning presented. But it should also be pointed out that this desire for success and faith in one's ability to improve not merely influenced the character of the learners' reactions in the ways just described. They helped to determine what particular emotional tone would accompany this practice. As long as the learner has faith in the possibility of his success he can and will continue to try and his performance will not be disagreeable even though he fails to improve for a time. This attitude and belief therefore enable him to continue his practice at high speed and to release more energy, even to direct it more economically and successfully than he otherwise would be able to do. It is the belief that no more improvement is possible for him, that he has reached his physiological limit, which dries up the learner's springs of effort and makes further improvement in that direction all but impossible for him. Until confidence in his ability to improve has been restored by necessity, interest, or some other means, further improvement cannot be made. It is in some such way as this that the "will to learn" unlocks the gateway to a learner's stores of energy and so enables him to put forth more effort, even to expend it more and more advantageously upon the details of the work. It produces an attitude of both body and mind which affects directly and favorably not only the process of initiating the new and necessary habits which must be developed but effects the flow of associations already developed and thereby aids the proper mechanization of the highest order of habits already formed, a process which is accomplished in part by making the learner always more satisfied or pleased with his success and more dissatisfied with his failure.

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[18] That our group of incentives aided the process of selection seems clear from the fact that in each of our experiments our stimulus groups made more rapid and consistent gains than did our control groups. This could not occur unless more efficient methods of control were initiated, selected and mechanized during the practice. We have shown how the desire for improvement increased the variability in the psycho-physical responses called forth by the extra energy put into the work, but just how or why these more economic responses get their prepotency and come to be selected and fixed in the course of the practice is not easy to see. That this step in the learning is aided by a knowledge of score and desire for improvement can scarcely be doubted. That some improvement can take place without it or by the substitution of hunger, fear, or other incentives to effort the studies of animal learning show rather conclusively. See article by Carr, *Psych. Rev.*, Vol. 21, p. 157-68.

It is in this sense that the desire or wish is father to the act. Belief in the possibility of success and a persistent desire for further improvement seem to be a necessary condition for the invention of the more economical methods of control required to attain the higher levels of skill in human learning. Without it the learner simply will not push himself on to the point of varying his reactions sufficiently to hit upon the more successful method of work but will continue to work like Bryan's telegraphers at "Podunk," or Kitson's printers, with the lower methods of control that have earlier been developed and which are sufficient to hold their jobs in their present position but with methods of control far inferior to their best response. But when a keen interest in improvement is aroused or when confronted by grave necessity or the need for an increase in skill a ceaseless experimenting in varied reactions begins in these same individuals and continues until a new and better method of control is found and laid hold of by the learners. It is a case where faith in one's ability to succeed and the desire or necessity for improvement actually bring it about.

There were scores of individual instances in each of our experiments which bear out the above assertions—cases of learners who for six, eight or ten practices had not made any measurable improvement and who openly declared that no further improvement was possible for them because they thought they had reached the limit of improvement and frankly stated that they had. These cases were uniformly treated in the following way. The subject was assured individually that his limit of improvement *had not been reached.* He was told that he would continue to improve if only he made up his mind to do so. As an aid to this end he was asked to set a definite goal a little ways ahead of the point reached in the previous practice and asked to make up his mind *definitely* to reach that point the next practice. There was not a single instance in all our experiments where this device did not prove successful in bringing about the desired improvement. But there were many instances, on the contrary, where certain subjects in our stimulus groups made a mistake of some 8 or 10 points in counting their score and recorded in particular practices a score that many points higher than was actually made. Yet in the succeeding practices of these individuals this fictitious score was not only attained in the next practice but regularly surpassed by the usual amount of gain in succeeding trials. And it should be added that such instances were not mere isolated cases, but were commonly found by the writer and his assistants who helped to give the tests.

Too much cannot, therefore, be said of the practical value of the mental set induced by the special conditions arranged in our experiments as a facilitating agency in human learning. It makes the learner a different reacting agent, more ready to exert himself on the task in hand, more ready to make the right responses, and makes it easier for him to select the responses that are successful. It increases the accuracy of his work and makes him more pleased with his successes and displeased with his failures and in other ways aids him in the formation and exercise of the higher methods of control which must be initiated, selected and finally perfected to increase his skill in that line.

It is also more than probable that the attitude of mind which our group of incentives induced in the learners lessens the chances for fatigue because it makes the right responses more ready to act, more easily controlled and so less expensive to the organism. As one of our subjects put it, "When I am interested and succeeding the right movements seem to come and follow each other in proper order more of themselves." It is also quite likely that success and faith in one's ability to improve make it possible to release more energy and perhaps to tap unused stores of energy not tapped heretofore. Also to apply it more easily to the details of the work and to the business of varying one's mental and physical reactions in a way that will initiate the higher methods of control. This much seems certain: it helps the learner leave behind his older and slower methods of work and so to vary his responses to the situations presented by the learning that the more economical methods of work may be invented and used.

A word might also be said about the general validity and significance of this interpretation of our results. Interest in improvement as such and confidence in one's success are among the strongest incentives not merely in learning but for all human endeavor. Every successful scientist is intensely interested in seeing his own hypothesis or theory confirmed or disproved. It is this interest in his results that literally drives him on and on. An idiot or man or woman who makes no progress in his or her work is not interested in making hypotheses or in trying them out. But an investigator or inventor has a keen and abiding interest in the problem he is studying and in the hypotheses which he makes. In science this interest in a hypothesis must be balanced by an equally keen nervousness lest one become deceived by his discovery, as in learning the progress of the learner must be checked up by accurate measurements and definite standards which show not merely what has been achieved but what really may or ought to be attained. In science and our search for hidden truth this necessary feature of the learning process has been crystallized into a method of verification called scientific technique. This enables the scientist to verify his findings *ad libitum*. In learning, each subject should measure his advancement by a reliable and definite standard. For to be successful this "will to learn" must be more than a mere empty desire for improvement or sheer act of will. The desire for improvement must be continually checked up by fixed and reliable standards. For without such standards or methods for measuring the results actually attained our group of incentives would be powerless to produce its helpful results; *with* the aid of a reliable standard and an accurate method of measurement the learner is able to release more energy and to apply it always more economically and surely to the right details of the work. This being the case, we should make a more careful study than has yet been made of the exact ways in which this "will to learn" and belief in the possibility of improvement may best be instilled in individual learners.

2. *How "Will to Learn" and Confidence in Success May Best Be Aroused and Maintained in Learners*—Several years of experimenting with intelligence tests, coupled with a more

or less careful study of the causes of success and failure in school and life, have convinced the writer that persistence, or the tenacity and steadiness with which an individual attacks his tasks in learning and life, has as much or more to do with his ultimate success as does his native mental endowment.[19] Many observations were made in the present experiments which point in this direction. In the section on results it was shown that some individuals were influenced directly by this special group of incentives; others seemed to be less impressed. For some this influence reamined steady and continuous; for others it was unsteady and erratic. A few could not be directly or permanently interested in their improvement as such by the directions and devices which we employed in our experiments. When we consider how important for advancement in learning this interest in improvement and belief in its possibility really are, the question of how such interest and confidence can best be aroused takes on a new and peculiar significance. For arousing this attitude of mind or such a helpful mental set towards the task of learning, the following devices are suggested by our data:

1. It would prove helpful if the learners could be shown, by actual figures and facts, such as we have obtained in these experiments, that this desire for improvement is not mere empty phrase or theory, but a necessary condition for advancement in learning.

2. Learners should also be made to feel that it is really worth their while to make an effort to advance because it is sure to be rewarded by success and therefore is of practical worth to them. In observation it has been found, for example, that people observe best those things in their environment which have some practical significance for them. To become interested in his own improvement the learner must, therefore, somehow be made to feel that such an interest is really desirable and worth while for him.

3. A third aid is to have a reliable method of measuring the progress in learning that is actually being made and a just standard for evaluating the results of such measurement, one which will enable the learner not merely to measure the progress he is making but to evaluate all he does in terms of what might reasonably be expected from him or from an average learner at least; a standard which takes into account the fact of individual differences in capacity to learn as well as world standards of achievement derived from the records of the most

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[19] We are speaking here only of those who have a moderate or normal grade of intelligence. For persons whose intelligence is distinctly subnormal this would not hold.

successful workers in that field. Standards play a very definite and direct part in all human efficiency and development. A genius in music will set a new standard for a host of lesser geniuses who forthwith measure up to his plane of achievement. A reliable standard and method of measuring progress in learning are therefore one of the surest ways of helping the learner to bring it about.

4. Again, by keeping the learner succeeding and by actual measurement he may be assured that his limit of improvement has not been reached. This can best be done by directing his practice and work in such a way that he will continue to improve. If we give him the kind of guidance and direction that will enable him to succeed and then demonstrate for him by accurate measurement the fact that he is actually succeeding he will be given the necessary confidence to feed his interest and desire for even greater success. In learning, as in everything else, nothing succeeds like success; and to keep the learner succeeding he must believe in its possibility, be interested in improvement as such, and be given enough guidance and help to keep him succeeding.

Such help cannot always be given, for the simple reason that the different types of learning have not been studied sufficiently to determine the facts needed to give our learners the kind of help they need to make their progress economic, continuous and sure. But as we cannot wait in actual life until the whole truth has been determined and verified, so in teaching we must do the best we can without these facts. Until such studies are made we should make special and constant appeal to the "will to learn" and arouse in each learner a strong and abiding belief in the possibility of his own success. For it is the necessity or desire for improvement and the belief in its possibility that actually bring it about in all cases of *undirected human learning* where the problem of initiating and developing new and higher methods of work is left for the learners to work out for themselves.

5. Other incentives which might be used to arouse a pupil's "will to learn" are to demonstrate the fact that others have and are improving beyond the point attained by him; that others have also failed for a time as well as he, but that they have succeeded in mastering all the difficulties involved. This may be done by using a typical learning curve with its early rapid rise, its plateaus and its later slow but more gradual rise, explaining the cause of each. For reasons which have already been indicated, one of the most important problems in any field of acquisition is to determine just how the learners in that field may have their interest in their improvement

awakened and sustained throughout the practice. Most learners and teachers fail just here because the importance of the problem is not recognized and because they do not know how to induce in themselves or in their pupils a lasting interest in the work or make them feel that further progress can and really should be made.

3. *Why Many Learners Fail To Improve*—The reason why so many learners fail to make the improvement which they really should make may be due to any one or some combination of the following causes: (1) They may feel that they have more important things to do and so are not interested in their improvement as such. They will, therefore, not make themselves rise above the common level of mediocrity. (2) They may desire to improve but do not care enough about the improvement to put forth the effort that is required to develop the new and more economical methods of control. (3) They may need specific direction and help because they do not know how to direct their own practice. (4) They may be unable to put forth enough effort to carry on the ceaseless experimentation which is required to enable them to discover the more economical methods of control for themselves. Better methods, better directed learning, more zeal, actual interest or motivation and a firm belief in the possibility of success sum it all up. It is a deficiency in one or more of these respects that accounts for the failure of most or all individuals to make their rate of improvement steady and continuous.

But it should be pointed out in closing that what is just as important as arousing this "will to learn" and a desire for improvement is to know *when* such a desire should be aroused and definitely appealed to and when all atempts at further improvement should be discontinued and definitely discouraged. It is not desirable to attain perfection or the highest degree of success that is possible for an individual in every type of acquisition that he takes up. No one would insist today on having all learners attain the highest possible speed and accuracy in addition. The adding and calculating machine has made this unnecessary. Perhaps if more attention were given to the *amount of success* or *degree of skill* which each individual *should* attain in each type of learning, their desire to improve in the fields where advancement really should be made could be more easily and surely aroused because it could then always be shown to be necessary and worth their while. Is it not because we use so little judgment in regard to what really should be learned and in regard to the limits of skill which ought to be reached in each field of acquisition that learners so often develop the attitude of mind that it is not worth their while to try, and so fail to become interested in making all the improvement that is possible for them? It is of course also important to apply the well-known principle which Senator Stanford found so effective in the training of his young colts, when he said: "It is my aim to get the greatest amount of exercise without fatigue, and never to allow it to reach the period of exhaustion. . . . If colts are never over-worked they are always willing to try in their exercises, having no apprehension that they will be forced beyond their comfort."

EDUCATIONAL DEPARTMENTS OF CORPORATIONS IN THE PITTSBURGH DISTRICT

By Donald Dwight Kennedy

In the last ten years the corporation school as a factor in American education has come rapidly to the fore. A growing need has been felt by business men for the more highly trained worker; for the worker who has received training of a different type from that offered by the public schools in general. The attempted solution of this explains the rise of the educational training department among corporations.

A utilitarian purpose is at the bottom of the growth of such a department. The corporation school is established and maintained to increase the efficiency of the individual worker, and thus to increase the efficiency of the business as a whole. The accomplishment of this aim is determined by business men on a practical basis. The corporation school will be continued only so long as it does more efficiently and more economically than otherwise possible the following things:[1]

(1) Make available more highly trained workers.
(2) Make available more employees who are capable of filling higher positions.
(3) Increase the quality of product.
(4) Decrease labor turnover.
(5) Decrease waste.

The corporation school has experienced the most of its development in the last twelve to fifteen years.[2] The first apprentice school was established in 1863 by the Chaix Printing Co. of Paris. In America the first attempt along educational training lines by a business concern was that made by the R. Hoe Printing Press Co. of New York. Their school was established in 1872. The movement did not gain ground until about 1905, however. In 1902 the General Electric Co., West Lynn, Mass., established an apprentice school. Their example was followed by the R. R. Donnelley and Sons Co. of Chicago, in 1908, and by the Southern Pacific Co. in 1909.

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[1] A. J. Beatty, "Corporation Schools."

[2] A. J. Beatty, "Corporation Schools."

The pioneer of the corporation school movement in the Pittsburgh District was the Westinghouse Electric and Manufacturing Co. at East Pittsburgh, Pa. The Westinghouse Technical Night School was founded in 1902, followed by an apprentice school in 1906. The Carnegie Steel Co. established a sales school in Pittsburgh in 1910, and in 1913 founded an apprentice school.

This movement in industrial education took real form and assumed wide significance in 1913 when a National Association of Corporation Schools, later changed in name to the National Association of Corporation Training, was formed.[3] On January 24, representatives of forty-eight companies assembled in New York, constituting the first meeting of the Association. By the 1921 assembly one hundred and fifty-six industrial and commercial companies were on the member list. The object of this National Association is "to assist management in developing the principles and practice underlying the training of employees by co-operating with member companies through research work and exchange of information as well as with educational institutions in the establishing and sharing of suitable training courses to the end that the general level of efficiency in industry be elevated."

Investigation revealed that twenty corporations in the Pittsburgh District (a circle with Pittsburgh as the center and a radius of about twenty miles) were conducting educational training work. These corporations were of three types—commercial, public utility and industrial. Of the twenty mentioned, six are commercial concerns, four are public utility companies, and ten are industrial corporations.

The training program in the commercial field is the first to be considered. Six Pittsburgh department stores have established training schools with special staff, equipment and organization. Salespeople, cashiers, wrappers, inspectors, assistant buyers, elevator operators, floormen and in some cases managers receive training in this department.

In department stores, the work of the educational training department is of three general types—initial training, follow-up training and group instruction. Initial training applies to that portion of the work which deals with the introduction of new employees into the store. Such training is given only as occasion demands, and, for the individual person, lasts for relatively a short time; never for more than two or three weeks, often for only two or three days. Follow-up training is training on the job and is carried on on the selling floors of the store. It consists mainly of a checking-up process by observation. A large portion of the time of the store instructors is spent in this type of work, much emphasis being placed upon its effectiveness. Particular attention is paid to new employees during the first month or two of their employment. Group instruction includes all group meetings called for informational purposes.

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[3] National Association of Corporation Schools, *Proceedings*, 1904.

The instruction in the initial training period consists of training in store system, service, type and characteristics of merchandise, salesmanship, and policies and rules. Of course the exact nature of the training depends upon the position which the new employee is to fill. New members of the store force receive this preliminary training during the first mornings of their attendance at the store. At least three such mornings are consumed. After that they come back for a few final lessons in salesmanship and merchandise.

In the follow-up training the instructors of the educational department go out through the store and observe the employees at work. In this way an actual check on the efficiency of the individual is obtained. In the main this type of training conforms to the following lines: general appearance and neatness, sales efficiency, system operation and merchandise knowledge. Store instructors spend most of their time on the selling floors of the store, observing, noting mistakes, assisting, and making corrections.

No definite schedule, either as to time, length or subject matter, is followed in group instruction. Groups of from fifty to one hundred and fifty are called in from time to time as need arises. One store gave a series of motion pictures, including processes of manufacture and methods of marketing of goods. So called "pep" talks were also frequently provided. New lines of goods or changes in system call for frequent group work. The usual time for this type of classroom work is between nine and ten in the morning, and between four-thirty and five-thirty in the afternoon.

The number of instructors engaged in the educational department varies from stores having only one teacher to one store where there are six instructors. Out of the total of sixteen instructors engaged in this work seven had approximately a high school education while nine have had higher education. Above all, experience in mercantile lines and store work is requisite. For instructors the management demands people who are well versed in the methods and problems of store selling.

The term most generally used in denoting this phase of store work is that of Training Department, or Educational Training Department. The head of this department is called Director of Training or Educational Director. In four stores he is responsible to the store superintendent; in two stores he or she is responsible to the personnel manager.

The second group to be considered after having finished with the commercial field is the one including four public utility corporations. The training work in these companies is carried on, first, by means of a plant school; second, by means of vestibule schools; third, by means of correspondence courses.

By a plant school is meant a definite department organization with physical equipment and isolated location, established for the purpose of instructing and training employees in plant processes, elementary and advanced. The courses offered are of the intensive type, requiring thorough training in numerous operations, and requiring a long period to complete the series. A vestibule school offers short-term intensive training courses in single units to develop ability to produce in some particular line. Correspondence courses are those carried on by written instructions and answers, and are individual.

A telephone company has organized a plant school for the training of plant employees—employees engaged in the maintenance of wire, cable, and central office, in construction of new equipment and in repair work. The school is located on one of the upper floors of the plant building and consists of one room of about twenty-five hundred square feet area in which is placed all the apparatus in connection with telephone work.

The employees of the company are classified according to the type of work they do—central office, installation, line, cable, repair. They are also divided into apprentices and advanced workers. There are four apprentice grades and six advanced grades in each division. To each division and to each grade there is a corresponding course in the plant school. In addition there are about ten special courses, making in all a total of sixty-five courses.

It takes from four to five months to complete the four apprentice courses. Each course lasts for about one week, but intervals of from three weeks to two or three months intervene during which time the employee is acting as a helper.

When the apprentice courses are finished the employee becomes a productive worker of advanced grade. There are six higher courses for each of the five groups of plant work. These courses vary from one to three weeks in length, the student entering at any time and leaving when the course is finished. To take one of these courses the employee must be recommended by his division head.

The school is open from 8 A. M. to 5 P. M. except Saturdays, when it closes at noon. One distinctive feature is the fact that all instruction is individual, no classes being held. This permits employees to commence any course at any time, and to leave school when the appointed amount of work is finished or the required skill is secured. Each student has certain specified tasks to do which he accomplishes through the instructor's guidance, through standard specifications and through the instructor's notes. Attendance at the school during the period of enrollment in it is for the full day. At the same time the employee receives his regular rate of pay. Grades are obtained from two sources—examination of manual work, and tests. An average grade is obtained and placed on the school report.

Three instructors compose the staff. About twelve students are in attendance at any one time. During an average month there are about thirty courses given to an average of seventy employees. The school is closely tied up with the various superintendents and heads of departments of the company. Division heads make all recommendations for school training, and receive definite reports of progress from the school supervisor.

Vestibule schools are operated by the telephone company above mentioned, and also by a street railway company. For the purpose of training girls as central telephone operators fifteen to twenty instructors are engaged in the school. Their work consists in giving instruction in policies and rules of the company, and in training in the actual manipulations and operations attendant upon successful exchange work. Motormen and conductors receive their training in the vestibule school of the street car company. A school car is maintained in which new employees are instructed under experienced operators.

Correspondence courses are conducted by three companies. One course in the elementary laws of electricity and telephone theory runs for a year. Approximately one hundred students complete the course in a year. Another company has a series of six correspondence courses including mathematics and mechanics, heat, steam boilers, steam engines, gasoline automobiles, and business law. Still another company offers a similar series to employees, including in addition commercial engineering, and advanced electricity. Enrollment was about two hundred students in the last two series. A nominal tuition is charged per course, which is refunded upon satisfactory completion of the course and remainder in the company. One unique feature consists in the appointment of advisors for each of the courses, these meeting with students for general discussion once or twice a month.

In brief summary the training programs in the public utility field are of two types—training for a specific position, and training of a general nature. The plant school and the vestibule schools give training for a specific position. On the other hand, the correspondence courses provide training of a general nature.

Having considered the commercial and industrial fields, the final division, the industrial group, remains for discussion.

As near as could be determined ten industrial corporations in this distict are conducting definitely organized educational training work. Definite data as to the number of workers which are employed by these companies were not available, but it approximates thirty-five thousand men and women. The actual number of people to whom is open opportunity for training does not surpass fifteen thousand. About three thousand are enrolled in classes or course series.

The different classes of employees to whom such opportunity is afforded vary with the company. In some companies some opportunity is provided for all. In others, classes are open to plant employees, apprentices, foremen and supervisors, office employees, technical school graduates, salesmen, women and negroes. The apprentice system is different from that of the preceding age, although retaining the same fundamental purpose. Restrictions are not as great, length of apprenticeship does not exceed four years, and a definite wage is paid. The classification office employees includes workers in business offices, general offices and drawing rooms. The technical school graduate group denotes those young men who have just finished their engineering courses and are now being inducted into industry.

In surveying the different educational departments it was discovered that the training programs in operation could be grouped into four types: (1) training for a specific job; (2) training in company business as a whole; (3) training of a technical nature; (4) training of a general nature. Training for a specific job includes such courses as those training apprentices to be machinists, pipe fitters, etc., and such ones as those preparing women to be stenographers. Training in company business as a whole is illustrated by courses given foremen in the industrial and manufacturing processes of the plant. Training of a technical nature, the third type, includes programs for technical school graduates with a practice study plan in operation; it includes also engineering courses for plant employees. The last type, training of a general nature, includes Americanization and English schools, cultural classes and courses for women in sewing and domestic science.

Several different types of schools have been established to carry on this education work. Three night schools are in operation; four apprentice schools, five English schools, one technical graduate school, two sales schools, one office training school, one works school and three foremen schools are also being conducted.

The night schools were established, in the main, to provide an opportunity to employees to obtain instruction in cultural subjects. Some technical instruction, however, is also provided. One company has a night school with an enrollment of over one thousand. The school is governed by a Board of Trustees, and managed by a president, secretary, and manager. The president is also the manager of the educational department. This night school has five departments—engineering department, preparatory department, foreign department, special technical department, and women's department.

The engineering department has a four years' course in fundamental engineering principles. The preparatory department has a two years' course in public school subjects, affording employees an opportunity to finish their graded school course. The foreign department has a two years' course in written and spoken English and in Americanization for foreign-born men and women. The special technical department offers special courses in advanced technical lines. The women's department gives a two years' course in sewing and in commercial branches; a one year's in preparatory training and in calculating-machine operation; special courses in training in English and dictation for stenographers and in millinery.

Classes are held on Monday, Wednesday and Friday nights. The year consists of two terms of nineteen weeks each, beginning September 7 and ending about June 6. Admission is open to all employees and wives without regard to previous education or occupation. The school is located in three public school buildings of the community, all within fifteen minutes' walk of the plant entrance. The expense of the school is borne about equally by tuition charges and company appropriation. Graduates of the engineering department and of courses in the women's department are granted diplomas.

A faculty of seventy-three members takes care of the class and shop work. Of this number, sixty-seven are company employees, and six are otherwise engaged. Eight of the faculty are graduates of that same night school, thirty-three have collegiate degrees, and seven have higher degrees.

A students' association has been organized with duly elected officers to supervise and manage all student activities. These include a string orchestra, an official school paper, football and basketball teams, and social functions such as dances, plays, concerts, banquets and smokers.

Another night school with an enrollment of over two hundred is in operation. Here also the purpose is to offer to employees an opportunity to get some of the cultural and theoretical subject matter which they would be unable to obtain otherwise. The courses offered are in Americanization and English, drawing and mathematics, physics and chemistry, and electricity. Classes are held two nights a week.

The foreigner who does not understand and cannot speak English gives an excellent chance to the industrial "trouble maker" to cause friction and bad feeling. The foreigner, too, in places where he understands neither the conversation of his co-workers nor the commands of his superiors, is often sullen, morose and unapproachable. To combat such situations Americanization classes and English courses have been organized.

The training offered, then, by English schools is general in nature, the sole purpose being the instruction of foreigners. The benefits from such instruction are three—to the worker, to the company, and to the state. It benefits the worker through enabling him to master his environment with more ease; it benefits the company through making its employees more efficient; it benefits the state through making these people better citizens.

Several companies carry on their Americanization work in night schools. The companies that do not have night schools have distinct English schools and are co-operating with the Board of Education in the training of the foreign employees. The plan consists of the Board supplying the teachers and the company furnishing the equipment. The time of holding these classes comes in the late afternoon after work is finished. One company follows the plan of giving their English classes on Sundays.

The training of apprentices is carried on in apprentice schools and is distinctly of the training for a specific job type. Pattern maker, foundryman, machinist, tool maker, electrician, printer, draftsman, blacksmith, boiler maker, carpenter, mason, pipe fitter and roll turner are some of the trades for which apprentices are at present being prepared.

The training program of apprentices is twofold, consisting of (1) shop work and (2) classroom instruction. The shop experience consists of the usual manual training in the use of tools and hands in connection with the particular trade. As an example, the electrician "acquires a broad and thorough knowledge of the construction and operation of electrical machinery. The experience includes the construction of switchboard details, the wiring and assembling of switchboard and control panels, factory wiring and the installation of electrical machinery. After the apprentice has a thorough knowledge of these details he takes up the winding, connecting and assembling of motors and generators. This is followed by experience in winding, building and mounting of all types of transformers. He is then assigned to the testing department where he obtains experience in determining the electrical and mechanical characteristics of the various types of apparatus which he has helped to build in the shop. Opportunity is also offered for special work on steam turbines and condensers, pumps and reduction gears, on meters, instruments and fan motors, and on domestic and industrial heating appliances. During the last year opportunity is given to specialize in some branch of the work for which he is best fitted. This training particularly fits young men for the manufacturing, testing, selling, service and operating fields of the industry."[4]

The classroom instruction received by the apprentice consists of a minimum of four hours per week during the entire course. Classes meet from 7 A. M. to 9 A. M. in a classroom of the educational department for the study of mechanical drawing and practical shop problems. All work is taken from points in the actual experience of the apprentice, no texts being used. The instruction in mechanical drawing includes blueprint reading, sketching, layout problems and tool design. The instruction in shop problems includes problems in English, mechanics, shop system, algebra, geometry and trigonometry, and their relation to shop work. In many cases the fundamentals of the sciences applicable to the trade are made a part of the course. Two additional hours each week are required of the student in home work. Instructors are obtained for the trades apprentice school from the engineering, drafting and shop departments.

Definite shop schedules are maintained for transferring apprentices from one department to another. These are administered by the educational department.

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[4] Westinghouse Elec. & Mfg. Co., "Trades Training."

Necessary qualifications for entrance into the company as an apprentice are:

(1) Be between 16 and 19 years of age.
(2) Have physical vigor.
(3) Have a good moral character.
(4) Have a good elementary school background, especially in history, geography, English and arithmetic.
(5) Have two years' high school training for electrical course.
(6) Be able to present letters of introduction.
(7) Have a personal interview.

The first three months of the work constitute a probation period. At the end of this time, if the apprentice is willing, and exhibits the right characteristics, he is regularly employed as a member of the organization and enrolled in the apprentice school. At this time an apprentice agreement between the company and the boy in conjunction with the parent is executed covering the entire term of service. These trades courses consisting of supervised experience in the shop and instruction in the classroom cover a period of four years, the apprentice observing regular shop hours. The compensation of the apprentice is determined on an established basic schedule, and is advanced every six months.

A complete record of the shop work and classroom work of each student as reported by shop foremen and instructors is maintained and kept on file in the office. Apprentices who maintain an A grade can complete their course in forty-four months instead of in forty-eight. A certificate is issued by the company to each graduate trades apprentice upon his completion of the course.

The length of apprenticeship varies slightly in different companies. One steel company sets the period at three years, but the most general length is that of four years. The number of apprentices enrolled in apprentice schools in the Pittsburgh District is close to two hundred and sixty-four. Such schools are in existence because it has been found that boys can be trained in the theoretical and practical aspects of their particular trade in a quicker and more efficient manner if this training is conducted under the supervision of a training department organization with definite procedure and requirements established.

Sales schools are conducted for the purpose of teaching company business as a whole. These courses are characterized by a short intensive period of training during which the entire time of the student is spent in grasping the fundamentals of the manufacturing processes used in the production of the company goods. This is accomplished by morning lectures, afternoon inspection trips and the requirement of papers and reports.

One company has a type of office training school in which employees are trained for stenographic and clerical positions in the offices, the period of instruction varying from five days to three weeks.

Another school which is entitled a works school is operated by a steel company for the purpose of making available instruction in the manufacturing processes of steel making to all employees. This instruction covers a period of two years, four hours per week, the class using the book "Making, Shaping, and Testing of Steel" which was compiled by the educational department of that corporation. The students are excused from work to attend class during the day, receiving their regular hourly rate for the time.

Foreman training as conducted in the foreman school of one of the companies consists of training in the company business as a whole. Ten men recommended by the mill superintendent compose each class. They meet twice a week at a suitably located room, and during working hours. The complete course consists of one hundred and seventy-five lessons, and takes two and one half years to finish. In scope it covers all the activities of a foreman in a steel and wire mill, and all the processes therein, but does not go extensively into any one subject.

The course consists of a group of lessons on the following topics:

(1) Study of the fundamentals of physics and chemistry underlying all steel and wire processes.
(2) Technique of steel and wire production.
(3) Management.
(4) Welfare subjects.
(5) General engineering problems in the construction and operation of a plant.
(6) Business English.

The printed unit lesson system is used in general, but standard works on different subjects are used as texts. The class hour, or the recitation, is divided into periods for free discussion, quizzing, and demonstration and lecture. The members are graded according to educational record, service record and observed characteristics. These ratings are filed and make a valuable index for reference in case of promotion. Upon completion a diploma is given to each student.

The technical graduate school, or special training school, under observation in the Pittsburgh District was of the study-practice type, a scheduled work program through the shop being accompanied by group instruction. The purposes of such schools are three:

(1) To prepare for a specific task.
(2) To instruct in the company business and processes.
(3) To prepare for advancement.

The main purpose of this school is to give an insight into the business as a whole. A complete description of the school is given in tabloid form.

Characteristic features:
  Students' time partly productive;
  Attendance on related instruction work is compulsory;
  Students are selected by the company;
  Instruction work is given on company time;
  Students receive pay while taking the course;
  Length of course one year;
  Instruction work is done in groups;
  Varied work assignments under actual working conditions;
  Great variety of experience in comparatively short time.

Students:
  Graduates of technical schools;
  Selected by training department.

Educational methods:
  Definite plans for entire course;
  Training department shifts men to give a variety of experience;
  Work assignments chosen on account of their value as experience;
  Order of taking up various work determined by training department;
  Reports on work done in various departments;
  Outside reading required;
  Observation trips to related work;
  Talks and conferences with instructors and company officials;
  Records kept of success in educational work;
  Reports received from departments in which student is working;
  Full-time instruction on study work;
  Specially prepared work schedule.

Expense:
  Charged to general administration;
  Prorated to departments using the student permanently;
  Remainder charged to training department.

Results:
  Employee's fitness for a particular part of the business discovered;
  Basic foundation for future specialization laid.

Factors controlling the success of the plan:
  Selection of the students;
  Definite plans;

Closely related instruction;
Co-operation of all departments.[5]

Before specialization is allowed, the graduate is given a general training during which he is routed, according to prearranged schedules, through the various manufacturing sections, spending about one month in each of the major units. This general training in the constructive feature of the electrical industry lasts from three to five months. The student then goes to the second phase, the operation side, and spends from three to six months on the testing floor. Actual experience in a large number of type apparatus is provided. The last one to three months of the student's course is spent in intensive study of the special field which he has selected after obtaining the general knowledge and practical work afforded by the routing experience.

This finishes the consideration of the corporation school types in the Pittsburgh District. One of the most significant results of the movement in the district is the rise of a spirit of co-operation between industry and public school, and the establishment of an industrial and public school relations committee. Brief description of the background, organization and aim of this section is here presented.

Characteristics of our modern civilization are typified by such words as specialization, complexity, diversification, interdependence. Inventions and machinery, accompanied by volume production, increase in quantity and quality of human wants demanding to be satisfied, transportation and communication facilities—all have developed in the past few decades. Realization, in relatively full measure, has caused the present character of our environment and of our human relations. It has meant in past years an exaggeration of material progress, and of the desirability of its attainment through the crudest, quickest and easiest ways possible.

Our public school system evolved with the growth of our civilization. It has become established as an institution to meet the needs of each rising generation. The income of, and the specialized development attendant upon, the machine age, however, has been so rapid that the school systems have not yet fully been able to adapt themselves to the complex change, and to establish a type of education which will meet the requirements of that part of our population which is so vitally connected with industrial work.

That school administrators, school boards and the public in general realize this need for a new type of training, that they are aware of some lack in present educative processes, is evidenced by the rapid development in the past ten years of new kinds of secondary schools and courses, bringing the cosmopolitan high school, the household arts high school, the manual training high school, the commercial high school, the agricultural high school, and the trade and industrial high school.[6]

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[5] National Association of Corporation Schools, *Proceedings*, 1916.

With the opening of the twentieth century, modern manufacturing methods had destroyed the old type of apprentice training without readjustment on the part of the schools to meet the new conditions. Under the old apprentice system the trade knowledge and the industrial or vocational training of the new entrants into skilled work had been supplied by the master. New conditions and inventions separated worker, manager and owner, eliminated many of the old trades, and made impossible vocational education as operative under old processes. Because of our enormous resources, our unlimited supply of land, our isolation through distance and tariff, our ability to sell surplus goods to Europe, there has not been brought home to us the necessity of that economy of production that is only secured through the building up of an intelligent industrial class of workmen obtained by broad and specialized trade education. Post-war days and the breaking down of national barriers have brought international relationships, and have brought about competition with European methods and industrial processes made highly efficient, economical and refined through their application by workmen trained in a well-developed vocational education system.[7]

It is in the last ten years that trade and industrial high schools and industrial courses for vocational education have sprung up. In 1881 the first trade school in the United States was established privately in New York. By 1900 six such schools were in existence throughout the country. From 1902 to 1917 there was a period of investigation and discussion, bringing many reports upon European systems. Massachusetts, Wisconsin and New York led the way by passing trade school laws extending aid to local school units. In 1913 a National Commission on Vocational Education was appointed to study the situation. The commission found that 12,500,000 persons were engaged in agriculture, and 14,250,000 persons were engaged in manufacturing and mechanical pursuits. Not over one per cent of this total number had

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[6] Cubberly, E. P., "Public Education in the United States."

[7] Glynn, F., "Some Trade Schools of Europe," Government reprint.

had any opportunity for adequate training. Vocational training for the members of this group would have meant an increase in the total earnings of the group of at least $750,000,000 per year.[8] As a result of such investigations, Congress, in 1917, passed the Smith-Hughes Bill providing for federal aid in respect to the salaries of teachers in agricultural schools, the salaries of teachers in trade and industrial schools, and the expense in connection with the training of vocational teachers.

However, despite local action and federal aid, there is noticeable lack of plan, lack of standards, and lack of knowledge as to just what the final status of vocational education in the United States public school systems will be.

The logical way to solve the problem is through the united deliberation and action of industry and school. In fact the best plan will only be found through the co-operation of public school officials and industrial executives. One difficulty in the past has been that, although it was easy to secure definite school representation, it has been impossible to secure inclusive, complete and authoritative representation from industry. The National Association of Corporation Training has provided a medium through which this is taken care of in part by appointing a Committee on Industrial and Public School Relations, with representatives from industrial corporations and public schools.

It is believed that the best, the most practical and the most adequate solution of the problem of vocational education can come only through a working together of industrial and public school men. Is there any such co-operation in Pittsburgh, and if so what is its present status, aim and scope?

Pittsburgh has an active chapter of the National Association of Corporation Training. Pittsburgh also has a Board of Education and a superintendent of schools who are sympathetic with an extensive program of vocational education. Four years ago it was suggested that an Industrial and Public Schools Relations Section of the chapter be formed to bring closer together industrial and public school men who were interested in employee training. This section was organized at that time. The first years of its existence were spent in getting school men and industrial men acquainted with each other, and with the problem. Past work consisted of a preliminary survey of the situation. This year definite work was undertaken so that by the end of the study results could be presented to member companies and to schools which would indicate in clear fashion principles along which future development of the public trade school and the corporation school could proceed with the greatest efficiency, and with the most assurance possible of lasting and beneficial returns.

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[8] Cubberly, E. P., "Public Education in the United States."

To be able to obtain data which could be organized to show clearly the method of future procedure on critical points, it was decided that the work of the section for the year should consist of finding out:[9]

(1) What educational training each member of the various trades should receive to be one hundred per cent efficient.

(2) What opportunities in the way of possible number of new entrants each occupation offered per year.

(3) What facilities in the way of material equipment and teaching equipment the public schools offered for trade training.

(4) What training the industrial concerns would give or were giving, and how far the various companies would go in co-operation with the public school to solve the problem through a practical plan.

With the purpose in view, then, of developing a vocational education program for Pittsburgh, four committees were organized to accomplish the project. These major committees are:

(1) Committee on Vocational Analysis.
(2) Committee on Vocational Demands.
(3) Committee on the function of the Public School in training for Vocation.
(4) Committee on the Function of the Industries in Providing Training for Employees.

The section as a whole, composed of over one hundred members, meets once a month to receive reports of progress.

1. Committee on Vocational Analysis

The purpose of this committee is to determine the nature and amount of education and training which skilled workmen should have to reach their maximum productivity and efficiency. In order to do this, information is being collected on the following points:

a. A definition of the occupation, including a brief summary of general facts concerning it.
b. Duties of those engaged in it.
c. Knowledge required about the industry in general and about the specific occupation in particular.

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[9] National Association of Corporation Training, Bulletin, "Corporation Training," January-February, 1922; Leavitt, F.

d. Educational requirements, with particular reference to education in the theoretical aspects of the occupation.

e. Promotion possibilities.

f. Compensation. How does it compare with other vocations requiring about the same amount of education and experience?

g. Educational requirements, with particular reference to that training which comes from practical experience.

h. Physical requirements.

This material is being obtained through the analysis of twenty-one specific occupations found in typical industries located in Pittsburgh. They are: machinist, electrical, carpenter, foundryman, pattern maker, sheet metal worker, printer, plumber, mason, structural steel worker, stationery, engineer, stenographer, salespeople, clerk, auto mechanic, painter, baker, glass maker, barber, messenger. The information collected and classified will be reducible to statements of the nature of the training desirable and necessary to the proficient practice of the trade. The resulting facts will furnish, then, the actual basis for building up definite training programs for entrants into the various occupations.

2. Committee on Vocational Demands

This committee functions along the line of making a definite objective study of the numbers employed in each of the above occupations. The final goal is to find the total number of young people which enter each trade each year. As a method of doing this, the following questions were asked member and interested companies:

a. What is the total number in each occupation, as described by the section and as found in the list, now in the employ of your company?

b. What is the total number hired each year for each of the twenty-one occupations, including both experienced and inexperienced employees?

c. What is the total number of new employees hired each year for each occupation?

d. What is the total number of employees hired each year by each company in all occupations, i. e., not confined to the twenty-one selected?

The final result will be in the nature of an average amount, or probability figure, of what the demand of each occupation for new workers will be.

3. Committee on the Function of the Public Schools in Training for Vocations

The aim of this committee is to arrive at some definite knowledge regarding the ability of the Pittsburgh school system in its present condition to give trade training. In doing this the following studies are being made through the agencies of sub-committees:

a. Physical equipment available for the purpose of industrial education.

b. Teaching force that could be recruited for courses in industrial education from the present system.

c. Vocational guidance.

4. Committee on the Function of the Industries in Providing Training for Employees

In approaching the problem the committee evolved a questionnaire to be submitted to companies in the district. In this way it was felt that data could be secured which would serve as ground work for establishing some general notion as to the extent which industrial corporations could be expected to provide training, and as to the extent to which they were willing to co-operate in the matter. A preliminary testing indicates that corporations admit the value of more educational training for their employees, but are not willing to establish co-operative schools of their own nor to co-operate with the public schools in a practical way looking towards a solution through the working together of the two agencies.

The result of the work of the section as a whole will be a correlation and reconciliation of the reports of these four committees. The value of their studies as bearing on the main project is without question. The first committee's findings will show what each worker in the various occupations should have in the way of education. This brought into comparison with the number of young people which will probably enter each occupation—as found by the second committee—will be the basis of judging not only the quality of education to be given, but also the quantity of each unit needed. This will serve as an indication of the total amount. The decision as to how much of this the public schools should provide does not rest within the power of such a body. However, through determining what the public schools have available in present equipment (third committee), and through finding out the industrial attitude and present status (fourth committee), it will be possible to indicate some practical and just line of demarcation, up to which the public schools function, and beyond which industry functions.

These studies are not completed, and will not be finished before next year. Hence the effects on the public trade school and the corporation school are not discernible.

The future of the corporation school is assured in Allegheny County. Its spread depends upon the size of the corporation and of the locality. Small communities cannot be expected to and will not provide a progressive system of industrial education in their public schools. The results of the study in the Pittsburgh District indicate that in such localities large corporations have established and will continue to maintain extensive schools for apprentices, and employees in general. Large cities are rapidly adopting a progressive system of vocational or industrial training. In these places certain types of the corporation school such as the night school and the apprentice school are being displaced. This is evidenced by the fact that all the night schools and apprentice schools found were operated by companies situated in outlying towns, not in Pittsburgh. However, even here such departments as the vestibule school and the training department of stores will not be affected, but will continue to function definitely.

The continuation of the corporation school, in any case, will depend upon its utilitarian value to the particular company. This is judged upon its increasing the efficiency of the individual worker, and of the business as a whole by:

(1) Making available a greater quantity of trained workers.

(2) Making available more men of sufficient ability and training for promotion.

(3) Making an improvement in the product.

(4) Decreasing the labor turnover.

(5) Increasing the intelligence and morale of the employees, thus decreasing waste and accidents.

The best indication that the corporation school is meeting these requirements is its rapid multiplication in the last decade.

SUMMARY

1. Little uniformity exists in the administration of the educational departments of corporations.

2. The educational director has to be a man of high ability who has had technical and collegiate training and shop experience, and is of the executive type.

3. Courses are of the study-practice type and the pure class work type.
4. Length of training period varies from one week to four years.
5. Extrance requirements of students are determined by the educational department.
6. No standard qualifications exist for teachers. Some devote all their time to instruction, others only a part of their time.
7. Practice in regard to text-book usage varies, some using texts, others not using them.
8. Classrooms are located either in the company office building or in nearby public school buildings and libraries.
9. Methods of instruction employed were of the study-recitation, the laboratory, the lecture, the inspection trip and the correspondence method.
10. The training programs of department stores include:
    a. Initial training.
    b. Training on the floor.
    c. Group instruction.
11. Training programs of public utility corporations include:
    a. Plant school.
    b. Vestibule schools.
    c. Correspondence courses.
12. The training programs of industrial corporations include:
    a. Specific job training.
    b. Training in company business as a whole.
    c. Technical training.
    d. General training.
13. A practical study of industrial and public school relations is being made by the Pittsburgh chapter of the National Association of Corporation Training.
14. The large corporation school is found in operation by large companies which are situated in small communities.

THE NORMAL MIND

By Wm. H. Burnham

While the characteristics of the various forms of abnormality have often been described, the characteristics of the normal mind have been taken for granted. As we are concerned especially with the mental health of normal children, it is desirable to consider what is meant by mental normality.

The common aim of education and mental hygiene is adjustment. All are familiar with the idea of development and training as adjustment. We refer to the evolution of the physical organism as adjustment. We think of normal living as adjustment to one's environment, physical and social. We conceive of education as adjustment. Thus a speaker at the recent meeting of the British Association, referred to education as a deliberate attempt at systematic training in adjustment to one's environment.

Everybody today says that education means adjustment. Mental health also means adjustment; and all the forms of mental disorder and the like are now referred to as cases of maladjustment. In all this discussion of adjustment usually there is little that is directly helpful in regard to how children may be trained to make right adjustment and to avoid wrong adjustment or maladjustment, as we call it.

How may adjustment be made? What is the mental characteristic necessary for right adjustment? In a word, what is the essential characteristic of the normal mind? If we go to the books for an answer to this question, what is mental normality, the answer the books give is again adjustment. But this answer, as we have seen, does not make very clear what we really want to know, namely, what is the essential characteristic of a mind that is normal and can make right adjustments and avoid maladjustment? Can we not get some more adequate idea of the essential characteristic of the normal mind? Let us try.

Mental hygiene gets the facts on which it is based chiefly from six sources: (1) physiology and neurology; (2) psychology, normal and abnormal; (3) practical psychiatry; (4) modern sociology; (5) pedagogy and the study of children; (6) ordinary observation and folk thought.

(1) Let us look to physiology and neurology for an answer. Please recall the kind of organism that must make this ad-

justment to environment. We find that the human body is an army of cells, or, to use a better figure, it is a commonwealth of cells.

Modern science has shown the literal truth of the old Greek simile which likened man's body to the body politic. The human organism is a commonwealth of individuals. The number of these individuals is 5000 times greater than the total population of the earth. According to the estimate of Dr. Donaldson, the total number of cells in the entire body is 26,500,000,000,000.

"Thus," to quote Sherrington (6, p. 67-68), "the corporeal house of life is built of living stones. In that house each stone is a self-centered microcosm, individually born, breathing for itself, feeding itself, consuming its own substance in its living, renewing its substance to meet that consumption, harmonizing with its own inner life some special function for the benefit of the whole, and destined ultimately for an individual death. Day-long, night-long, in this commonwealth that constitutes each one of us, there goes forward as in the body politic the subservience of many individual purposes to one, the sacrifice of individual lives for the advantage of the many, and the birth of new units which replace the dead . . . And each of these living commonwealths began its individual existence as a single unit, whence arose the myriads that compose its adult being. Division of labour went on and with it differentiation of structure. A plan informed the mass that otherwise were a mere congeries of cells. There come thus to coexist the lime-hardened tissues of our bones, the contractile cells of our muscles, the conductive cells of our nerves, and so forth."

All of these units must work together for the common good. The functions of all are integrated in a condition of health. Only in disease do some of these cells set up a warfare against the commonwealth, or form a separate revolutionary faction, as, for example, in case of cancer, where a rampant and malignant individualistic growth occurs.

It is noteworthy that this most serious of all diseases is characterized by a growth distinctly dissociated from the normal development of the organism and representing a phenomenon of disintegration. Of this Dr. Seelig says:

"The growth of cancer cells is the most disorderly process conceivable. Of a sudden, and for no known reason, a certain cell makes up its cellular mind to have no regard for the laws governing the growth of the rest of its brother and sister cells. It proclaims itself an anarchist and starts in on a debauch of growth that knows no limit of size and no respect for the claims or the needs of the rest of the body. Just as the anarchist will do untold and irreparable harm to the social body, unless apprehended early, and properly dealt with, exactly so will the anarchistic cell do equal harm to the physical body, unless it and its progeny are apprehended and properly dealt with."

This integration of the physical organism is well illustrated by its relation to the poisons of pathogenic micro-organisms, as well expressed by Dr. Mott (4, p. 679) when he says:

"The vital impulse is in every part of the body, and it is certain that the more active the vital impulse in an organ or structure, the greater automatically is the supply of oxygen by the blood. Every particle of the body is as much alive as the whole and possesses a bio-chemical memory. In proof of this we know that immunity against disease is due to the body's having once defended itself against the toxins of a pathogenic micro-organism; its tissues are thereby sensitized against this particular poison, so that should the organism again attempt to enter the body, the defensive mechanisms are immediately mobilized and the organism destroyed before it can multiply in the body."

The highest form of integration is found in the master tissues of the human organism, the nervous system, composed of billions of neurones. This is made up of the central nervous system and the autonomic nervous system. According to some students, notably Kempf, the autonomic nervous system was the primitive original system, far older than the central nervous system, and the latter was developed after this. Possibly this may be true; but whatever the genetic sequence, today the evidence indicates that the central nervous system is the controlling system, and its special function is that of co-ordination and integration. No one has shown this so well as Sherrington; and this is the burden of his great book on "The integrative action of the nervous system."

Perhaps a word should be said about this term integration. The derivation of the word is familiar. An integer is a unit; we are familiar with it in the study of integral numbers. An integer has not been broken up into fractions. And again we speak of a man of integrity, that is, one with no break in his character, whose reputation is unsullied. Sherrington uses this word integration instead of the usual word co-ordination, thus putting emphasis on the unity, the wholeness and wholesomeness of the organism under the control of the integrative action of the nervous system. Co-ordination puts emphasis on the parts united, integration on the whole which results from the integration of the parts.

One or two paragraphs from Sherrington's writings express the essential facts briefly and clearly:

"The nervous system is that bodily system the special office of which, from its earliest appearance onward throughout evolutionary history, has been more and more to weld together the body's component parts into one consolidated mechanism reacting as a unity to the changeful world about it. More than any other system it has constructed out of a collection of organs an individual of unified act and experience. It represents the acme of accomplishment of the integration of the animal organism." (7, p. 352.)

"The portion in this system to which mind transcendently attaches is exactly that where are carried to their highest pitch the nerve-actions which manage the individual as a whole, especially in his reactions to the external world. There, in the brain, the integrating nervous centers are themselves further compounded, inter-connected, and re-combined for unitary functions. The cortex of the forebrain is the main seat of mind. That cortex with its twin halves corresponding to the two side-halves of the body is really a single organ knitting those halves together by a still further knitting together of the nervous system itself. The animal's great integrating system is there still further integrated and this supreme integrator is the seat of all that is most clearly inferable as the animal's mind. As such it has spelt biological success to its possessors. From small beginnings it has become steadily a larger and larger feature of the nervous system, until in adult man the whole remaining portion of the system is relatively dwarfed by it." (7, p. 352-53.)

Thus integration is the essential characteristic of the normal body. The study of the nervous system suggests clearly that integration is the essential characteristic of a normal mind as well.

(2) If we turn to psychology and consider the mental processes correlated with the neural processes, we find an equally great complexity. Naturally the mental processes may be as many and diverse as the neural. As Finzi, an Italian psychologist, has pointed out, the processes of the mental life are not static and permanent, but a series of phenomena which appear momentarily, and in an infinitely complicated causal relation, succeed each other in meteoric fashion as the manifestations of force between millions of elements, that is, the nerve cells, affected by an inconceivable number of influences of which he mentions a few, such as pulse and breathing, practice and fatigue; interest, peculiarities of attention, depth of the affective life, the infinite

series of emotions; atmospheric influences, presence of other persons, period of life—such are a few of these influences; and he adds, instead of a single or a number of curves, the variations in the mental life for a single hour would appear on paper like the graphic representation of all the sound vibrations of a Rossinian or a Wagnerian overture for a hundred instruments.

In spite of all this complexity of the mental life there is, however, a unity and relative simplicity. As Finzi further points out, the reaction of the organism limits the effect of external stimuli and the causes of the variations frequently compensate for one another so that all the waves and valleys of the curve move within definite limits, just as the changes of external temperature can change the inner temperature of our bodies normally only within a few degrees. The regulating conditions of what may be called psychic temperature are to be found in the psychophysical fundamental peculiarities of each individual, namely, in human personality.

The most normal form of mental activity, as noted in the laboratory and by ordinary observation, is in the process of attention, in the performance of a serious task. In this process we have an integration of all the mental powers and mental processes so that Professor Royce has rightly described attention as comparable to the tropisms in animal organisms; that is, attention is a reaction of the whole organism both physical and mental, a form of mental integration *par excellence.*

If we turn to abnormal psychology, there is a great literature on mental conflicts, on unwholesome mental complexes, repressed ideas, repressed feelings, psychic lesions and the like. All these are illustrations of various forms and conditions of disintegration of the personality, and indirectly illustrate the need of that unity and co-ordination of the mental and physical abilities that we have called integration. Of such pathological conditions of dissociation and the various forms of maladjustment, this is not the place to speak in detail, but the literature is easily accessible. For many of the less technical examples, one may consult Mental Hygiene, the journal of the National Committee for Mental Hygiene and the literature referred to in its pages; and Dr. Wells has given illustrations in his book on Mental Adjustments. His classification of the various forms of dissociation may be given here:

"We have quoted," (12, p. 156-57) he says, "a possible example of the first kind, in a breakdown of the digestive system. Here a process is dissociated not only from the personal consciousness (as it is normally), but also from the main tendency to survival. We shall meet a few other examples. In such cases, the distinguishing feature is the dissociation of some involuntary or unconscious function of the organism. Second, the ability to move one side of the body, or the lower half of the body, or to make the movements of speaking, may be lost. It is like a paralysis of the muscles that make these movements. Certain movements of these muscles are lost to the control of the main personality. They are dissociated from it. Third, a patient whose retina is unaffected may be unable to see objects outside the direct line of vision. Though his skin is healthy, he may be unable to feel a touch at some special spot. When this happens, it is a form of sensation, instead of a movement, that is dissociated from the main personality. Fourth, *ideas* may manifest themselves in a great variety of ways, without the main personality's being aware of the ideas. Prince's patient of the bell-towers gave a fair example of this, when her hand wrote automatically something not in the awareness of the then dominating personality. Fifth, the main personality may lose control of the organism, which is then dominated by a system of ideas split off from it. (Somnambulisms, fugues, multiple personality). Sixth, the main personality may be aware of the occurrence of a mental process, but not recognize the existence of the process as a part of the main personality. (Externalization, projection). For example, a patient complains that the 'voices' hurl insults at him. Of course, the voices come from nobody but himself; but he does not recognize the voices as coming from himself."

Besides these pathological forms of disintegration many minor forms appear in normal individuals. The pathological merely show in large letters what occurs in greater or less degree in everybody under certain conditions. Among the more important of these conditions are emotion and passion, especially fear and worry, extreme fatigue, the effects of drugs, indigestion, bad diet, and the like, and besides all these a vast number of minor distractions that have a strangely serious effect in disturbing us quite out of proportion to their real importance. Such are all the little difficulties and annoyances that beset everybody, like those referred to by the cartoonist Briggs as having such an effect that "the day is utterly ruined."

Most serious are the distractions of uncontrolled emotions and passion, the survivals of childish attitudes of selfishness, envy, fear, such bosom serpents as jealousy and the like, and a multitude of inhibitions, unfortunate conditioned reflexes, habits, etc. All these are disintegrating to the personality.

The evidence from psychology normal and abnormal again points to integration as the essential characteristic of the normal mind. We may then probably describe the normal mind as one in which the manifold impulses and mental processes are integrated for general purposive activity. Here again we can back up the evidence by the testimony of Sherrington. (7, p. 353.)

"The normal action of the mind is to make up from its components one unified personality. When we remember the manifold complexity of composition of the human individual, can we observe a greater example of solidarity of working of an organism than that presented by the human individual, intent and concentrated, as the phrase goes, upon some higher act of strenuous will? Physiologically the supreme development of the brain, psychologically the mental powers attaching thereto, seem to represent from the biological standpoint the very culmination of the integration of the animal organism."

(3) If we turn to practical psychiatry we find that most, if not all, cases of mental disorder are characterized by disintegration of the personality. The whole Freudian literature is full of illustrations of dissociation, repressed memories and affects, and all those skeletons in the mental closet whose disintegrating influence has made them characterized as psychic lesions. On the other hand, psychoanalysis brings about its cures by bringing the repressed associations and feelings into consciousness and by inhibiting their distracting influence by normal fusion with the stream of thought.

In a great number of cases of mental disorder, as we have noted, the best form of cure is re-education, and this consists in an attempt to develop concentration of attention, orderly association, and wholesome interests; in a word, an attempt at developing a wholeness and integration of the personality to take the place of confusion, distraction, interference of association, and the like.

(4) If we turn to modern sociology we find that the permanent existence of a social group depends on community of interests, especially on the integration of the individuals of the group in doing some significant group task.

The highest example of a normal social group is one in which the superior abilities of the different individuals of the group are integrated for a common purpose, and the highest kind of group leader is not one who dominates the group, forcing his own views upon the individuals, but one who integrates the abilities of the different members.

(5) Pedagogy and the study of children teach us that normal children are those who can give close attention, those that can choose their own tasks and work attentively in performing them; and on the other hand we find that the one most serious fault in a pupil is lack of attention, lack of concentration.

This means lack of integration. Many years ago Dr. Triplett (10) made a study in which he asked a large number of teachers to report the most common faults among their pupils. The one outstanding fault mentioned by nearly all the teachers was lack of attention.

A certain lack of integration, it is true, is characteristic of the child mind. A considerable amount of conflict and confusion is common. Especially is this true because the child is largely dominated by native impulses. Control of emotion has not yet been attained, and the higher integration of the personality found in the normal adult who has been properly trained is of course lacking. On the other hand, however, the lack of integration in the normal child is largely a lack of continuity and permanence in the mental impulses and sets of the mind. The mood and the behavior are now this, now that, constantly changing, and few mental attitudes are permanent, but for any given situation the integration in the mind of the normal child is often probably distinctly superior to that in most adults. The child suffers no distraction. His whole psychophysic being reacts to the present situation. For the moment he shows complete concentration of attention; and in children as in animals the better the attention of the child the more promising is he as a subject for training. Thus while the power of integration is undeveloped in children and the higher integration lacking, both in children and in adults alike integration of the personality is the essential characteristic of normality.

(6) The ordinary observation of everyday life and the folk wisdom of countless generations, give significant evidence. Our ordinary words to express mental unity and a normal condition of harmony are poise, self control, self possession and the like. None of them are adequate. The word serenity in its original meaning referred in large degree to this wholeness and unity of the personality, but this too is not adequate. The Platonic conception of harmony of the mental faculties and mental unity and wholeness, represented this characteristic of mental wholesomeness; but the technical word integration seems to be the best term to use in mental hygiene.

The words and phrases used in our daily conversation to characterize the lack of poise and integration of the personality, give striking expression of the common idea that unity of the personality is the condition of health. We refer to lack of integration as going to pieces, being rattled, going up in the air; and of a man who has suffered a nervous collapse, we say he is all broken up or he has gone to pieces. When a man has lost or never had this integrative ability, we are apt to say, "He is not all there." When a man suffers temporarily from this disintegration of personality and then recovers, we say that he pulls himself together.

The evidence from folk thought, as shown in maxims, proverbs, and the great moral codes, is similar. For example, the old Romans believed that if a general, when leaving his home to enter a campaign, stumbled on the threshold of his house, it was a bad omen. True enough, says Freud, for the stumbling was evidence that the man's mind was not clear and united for the purpose in hand, but some hesitancy and doubt prevailed.

Again as an example from the moral codes it is noteworthy that the Ten Commandments forbid envy, covetousness, and the most seriously disintegrating mental attitudes; and Jesus sums up the whole Decalogue in a positive command for integration of all the mental powers: "Thou shalt love the Lord thy God with all thy heart and with all thy soul and with all thy mind and thy neighbor as thyself."

Another significant piece of evidence from everyday observation is that furnished by the efforts, often pathetic, that we make to defend and protect our own personality. To this end we resent the mention of our faults and weaknesses even by our best friends. Most of us are strangely sensitive to anything that remotely suggests blame or criticism; we shirk responsibility lest blame should result; and if, as often happens, we develop a sense of inferiority in regard to certain things, we over-compensate and become pedantic in the thoroughness of our performance or perhaps obstinate in our behavior. Especially it is the blow at the integrity of the personality that makes the tragedy of failure to be understood and of unjust punishment or blame both in children and adults.

It is to protect the personality that we fool ourselves with excuses for our neglect of personal and civic duty, that we repress the memory of opportunities neglected and of failure in performance. For this the slacker and the neurotic become so clever in inventing disorders and extenuating circumstances. For this the discredited politician makes his pathetic efforts to come back. For this the crook sets a limit to the kind of crimes he will commit and retains some scrap of honor to float on the citadel of his personality. For this all of us resent any criticism of our real weaknesses and defects.

As Freud has written the psychopathology of everyday life, so some one should write the evidence from everyday observation in regard to what constitutes the essential characteristics of the normal mind. Every teacher could furnish significant facts. All this is best shown by concrete illustration. Only a single case can be cited, this pathological perhaps, but it shows in large letters the sensitiveness that everyone feels in regard to what seems to threaten the individual's own selfhood and personality, although most people are not sensitive to such little things.

I know no better case to illustrate this than that of Harrison Gray Otis Blake, the editor of Thoreau's writings. Mr. E. Harlowe Russell, who knew Mr. Blake most intimately, gave me permission to quote from an unpublished address in which he paid tribute to the beauty of Mr. Blake's character, and described in some detail his characteristic of extreme conscientiousness, in part as follows:

"I never knew a person who avoided with such care every approach to duplicity, prevarication, or inaccuracy of statement, who came so near telling on all occasions 'the truth, the whole truth, and nothing but the truth.' An oath administered to him would have been not merely superfluous but an impertinence. Indeed, the form required of witnesses in court might with propriety have been revised, so as to read, 'you solemnly swear that your testimony in this case shall be like that of Harry Blake with reference to the most trivial circumstance of everyday life.' "

The attainment of perfect peace of mind was, with Mr. Blake, the absorbing passion of life. "At times there was a suggestion almost of insanity in the excess of this craving for serenity, of which he himself was painfully aware, but he knew not how to moderate or control it. Whatever vitiated or obscured in the slightest degree this beatitude of spirit, which he was wont to call 'the vision of God,' was to his whole nature intolerable. It was in order to reach and dwell in this frame of mind that he bent all outward circumstances and conditions and strove to purge his conduct and his inmost thoughts of every disquieting motion and tendency. This was the salvation of his soul; he spoke of it as 'eternal life'; and there was nothing he would not freely give in exchange for it. What aggravated the difficulty of attaining this condition was a lack of the sense of proportion, in consequence of which very small obstructions often appeared formidable to his microscopic apprehension. To reach a conclusion with reference to the most trifling affairs was always a slow, and sometimes a painful process, because he had to weigh alternatives *separately* and could not put one thing against another and so dispose of both by a process of cancellation. In figuring, he carried his decimals to three places, and seemed always to want to carry them further. Moreover, he had not the power when he made a decision, to put it under his feet and stand upon it; he *had* to take it up again and again and re-examine it.

"No reading, no society, no work, however worthy, was satisfying to his nature if it failed to put him in a serene and luxurious frame of mind. This was the test which he applied to every influence from without and every activity from within—to literature, art, companionship, occupation, revery, everything."

Mr. Blake could not be depended upon to do anything at a definite date. If serene, he would lecture to the Concord Transcendentalists; if not, he must first of all attend to his soul. And his finger was always, as we may say, on his mental and moral pulse.

Such cases are especially instructive; for the experiences always have an affective character. No matter how trivial or banal the issue, as soon as it gets to be a matter of conscience it is significant, for it is a matter of feeling, and threatens disintegration of the personality.

While the evidence is conclusive that integration of the personality is the essential characteristic of the normal mind, and the aim of training in childhood should be to develop this, still one may naturally say that this is a counsel of perfection, that every one is subject to distractions, every one is lacking in the necessary integration of the personality, and that there are all degrees of this essential characteristic; so that the practical question still remains what constitutes the normal mind, what is the standard of normality, for the practical problems of daily life in society.

The answer to this is that the practical test of normality is that stage of integration that enables one to work at a significant task and that ability at adjustment that enables one to earn one's own living and get on peaceably in the social groups of which one is a member.

Roughly normality is a functional rather than a structural conception. We get the best idea of this from considering the physical organs. A normal eye, for example, is not an eye free from defects but an eye that under ordinary conditions can function normally. Practically all eyes, as shown by investigation, have, for example, errors of refraction, usually at least some degree of astigmatism. In most cases, however, the astigmatism is slight, the eye can make its own correction for this defect, and clear vision is possible without strain. All such eyes are functionally normal, and we shall not be far wrong in defining a normal eye as an eye that can make correction for its own defects and perform its functions in ordinary conditions without strain. The limits of normal variation in the condition of refraction, for example, would be the limits within which variation from perfect structure is possible without interfering with functional ability.

So with the other physical organs, and so, too, with the mind itself. The normal mind is not one that is perfectly integrated and free from defects, arrests of development, or even from attitudes and habits of thought that are similar to those characteristic of pathological conditions, but rather it is a mind that can compensate for its defects and weaknesses, that can correct its own errors and is able to control its pathological tendencies; or, in a single word, a mind that under ordinary conditions can function normally.

That this conception of normality is the only tenable one, seems to have been demonstrated in the war by the fact that every one, even with the strongest nerves, it was found, was likely to break down when subjected to sufficient strain.

Thus theoretically the normal mind is characterized by integration of the personality. From the practical point of view the normal mind has such a degree of integration that it can adjust to the ordinary situations of life, perform some significant task in society, and get on peaceably in the social groups of which one is a member. All this is merely saying in other words what has been admirably stated by Dr. Riggs from the point of view of psychiatry as follows: (5, p. 287.)

"Lastly, to avoid breaks in character, breaks between your ideals and your everyday actions, recognize that your problem is fundamentally the same as every one else's, no matter what your particular job may be. This problem of ours, reduced to its common denominator, is to keep our ideals clear, to adopt purposes that shall serve these ideals, and lastly to make our ideals live in practical, purposive, everyday action. To do this, it is first necessary to accept the material of life as good enough for us, as definitely *our* material, awaiting only our workmanship to be forged into success. This should be our method of making our dreams come true, of living up to our great illusion. Therefore, waste no time in kicking against the pricks. The 'divine unrest' of ambition is a noble spur to better action, but the restlessness of discontent is a miserable state of misunderstanding. Beware the contrary currents of anger, fear, and pride, but turn the strength of these currents into the channels of your purposes. Do not criticize your part in the play; study it, understand it, and then *play* it, sick or well, rich or poor, with *faith*, with courage, and with proper *grace*."

If then we may take this as representing normality, what can hygiene do to develop integration of the personality and to prevent disintegration and maladjustment? This brings us to the very core of sound education and mental hygiene. The problem is of course a very complex one involving the deeper questions of heredity and environment, the functioning of the endocrine glands, even diet and other factors of somatic hygiene, and especially individual differences, early training and the like; but can not mental hygiene give something simple to begin with, a fundamental point of view from which to study the more concrete problems in detail?

The answer is very simple, so simple that most people will fail to realize its significance. Hygiene and education can give opportunity for co-ordinated activity, physical and mental, in the doing of tasks worth while.

This leads to another more concrete and practical question, namely: What are the minimal essential conditions of human happiness? Reduced to their lowest terms, what are the fundamentally essential conditions of mental health—conditions universal for all, young and old, rich and poor, the educated and the uneducated, the different emotional and ideational types, the individual with robust health and the invalid alike? On the basis of observation and many investigations, the answer may, I think, be formulated very simply as follows: The essentials, without which a person cannot be quite sound mentally, and with which one can have no serious mental disorder, the absolutely essential conditions are three,—a task, a plan, and freedom.

The aim of mental hygiene is the care of the mind diseased, the prevention of mental disorder, and the development in the normal of habits of healthful mental activity. This aim is best fulfilled by the simple method already suggested. Again the aim of education put in its briefest form is the development of permanent interests of healthful, useful character. The development of interest is best accomplished by the doing of significant tasks. Thus mental hygiene and education adopt the same method for developing a normal personality. Both seek to accomplish this aim by the doing of significant tasks.

The great value of the task in training can be analyzed in part as follows: training in the doing of a task demands attention, and it develops vital interests. What a child does in performance of his own chosen task is his own. What he makes in a certain sense is a part of himself. Usually he should have a task that he can accomplish, in order that he may have the stimulus of success; but even if failure is the outcome, the doing itself contributes to the child's personality.

This is shown in the case of all classes of individuals, in all conditions of life, from the child in the nursery to the great leaders of men in their greatest endeavors. All the heroes of defeat, who have found their reward in the doing itself, whether the outcome be success or failure, who have found the fun is in the fight, who have experienced the fact that the battle for righteousness is worth while for its own sake, all these have written in large letters what is the truth for every individual. All co-ordinated activity integrates the personality. All successful doing develops confidence and strengthens the personality. The spontaneous doing of some great task develops a central interest. Action for the aims of some natural interest integrates the personality. Superiority in something significant develops the social personality. Co-operation in a democratic group, where the individual's superior ability is integrated in the ability of the group, in the performance of a group task, means a healthful relation of the individual to the group and a wholesome social development.

From the point of view of mental hygiene a maximum of freedom is necessary. A condition of mental health means adjustment. Mental disorder is lack of adjustment. The adjustment made by children in the first few years of life is vitally important. No one is wise enough to make it for a child. No one could do it if he had the wisdom. The child must make it for himself. To do this he must have freedom. Any prescription means inhibition. The necessary inhibitions come from the natural conditions of the task itself and a few important commands. If implicit obedience in a few things is inculcated these natural inhibitions are sufficient. At a later period more conventional training is necessary, less freedom and more adjustment. At all stages, however, as much freedom as possible should be granted.

With this training in adjustment and this pressure of convention and formal education, as represented by modern methods of formal training, acceleration and the like, mental hygiene emphasizes the truth that in all this education, this drawing out of the child's abilities, the child should not lose his own soul. In bodily hygiene, in somatic hygiene, we should never forget the familiar words of G. Stanley Hall,—what shall it profit a child if he gain the whole world of knowledge and lose his own health, or what shall a child give in exchange for his health? Likewise mental hygiene goes back to the more original form of this question. What shall it profit a child if he gain the whole world of conventional adjustments and lose his own personality, or what shall a child give in exchange for his soul?

We may well for a moment turn aside to note the wider significance of all this. The simple essentials mentioned, a task, a plan, and liberty, involve the most fundamental problems in human education and human society, and as regards the personal hygiene of the individual, nothing is more important than what we have summed up under the terms integration and adjustment.

Weak, finite, the victim of unknown forces, over which he has no control, man facing the reality of such facts develops either a wholesome sense of dependence, the essential of the religious consciousness, or else he acquires a sense of inferiority and loses his grip in the inevitable conflict. If rightly educated, he adjusts to his physical and social environment, and if rightly trained he integrates his powers to meet the problems that beset him.

As a result of training there is something more than what is usually understood by adjustment. Although weak, and the sport of unknown conditions and forces, with a span of life too short even to study intensively the personal problems of his own existence and his own health, it is possible for man to develop a wholesome integration which enables him to co-ordinate his powers to meet any situation however difficult, and to do the best possible within the limitations of his own personality, and at least to make a fight worth while for its own sake. And again by right training he is able to develop wholesome social relations and integrate his own little contribution with that of the social groups of which he is a member. The essentials for this training are at once the essentials of sane education and of sound mental hygiene. For both they are the same,—a task, a plan, and liberty.

To preserve the health of a social group the same conditions are essential, a group task and autonomy of the group, freedom to choose its tasks, to regulate its method of work, and so on. Simmel (8), who has made special study of the psychology of social groups, speaks of the existence of a common enemy which the group must fight against as the great condition of preserving, unifying, and solidifying the social group. This is true because the conflict with a common enemy means a common task which is vitally significant. While other tasks may not have as great unifying power, nevertheless, for continuous group activity and the permanence of the group, a significant peaceful task is quite as good as warfare with a common enemy.

A task for everybody, and a right attitude toward one's tasks, both individual tasks and group tasks, with leaders who can integrate the individual abilities of a social group, means social sanity and prosperity; freedom for each individual child to choose his own task and his own plan means the development of responsibility and initiative and the adjustment of the child to his environment. Do you dare to give freedom to the individual child and to the social group? It is dangerous. Do you dare to let a child choose his own plan when your own is so much better, at least so much more interesting? The scholastic product may suffer if you do. To such questions mental hygiene answers merely by another question: while it is dangerous to let a child choose either his task or his plan, is it not more dangerous to prescribe?

To sum up the whole matter from the point of view of neurology, psychology, psychiatry, and modern pedagogy and modern sociology, as well as from the point of view of the commonsense of all peoples, the evidence points to integration and adjustment as representing the fundamental condition of mental health; and put in its simplest terms, the essentials of the training that gives these fundamentals is the doing of tasks worth while and a maximum of freedom. In the performance of simple tasks the fundamental habits of mental health are inculcated,—attention to the present situation, orderly association, normal reaction to feeling, and the rest, and the attitudes of cheerfulness, service and co-operation, are developed; or, in a single word, integration of the personality is developed.

BIBLIOGRAPHY

1. Garnett, J. C. M. Education and world citizenship. Cambridge, Univ. Press, 1921. 515 p.
2. Jelliffe, S. E., and White, W. A. The modern treatment of nervous and mental diseases. London, Kimpton, 1913, 2 vols.
3. Kilpatrick, W. H. Coercion and learning. *Jour. of Educational Method*, 1922, Vol. 1, p. 182-189.
4. Mott, F. Body and mind: the origin of dualism. *Mental Hygiene*, Oct., 1922, Vol. 6, p. 673-687.
5. Riggs, A. F. Nervousness: its cause and prevention. *Mental Hygiene*, 1922, Vol. 6, p. 263-287.
6. Sherrington, C. S. The integrative action of the nervous system. N. Y., Scribner, 1906. 411 p.
7. ———— Some aspects of animal mechanism. *Science*, 1922, Vol. 56, p. 345-354.
8. Simmel, G. Soziologie; Untersuchung über die Formen der Vergesellschaftung. Leipzig, Dunker, 1908. 782 p.

9. Southard, E. E., and Jarrett, Mary C. The kingdom of evils. N. Y., Macmillan, 1922. 708 p.
10. Triplett, N. A study of the faults of children. Ped. Sem., 1903, Vol. 10, p. 200-238.
11. Watson, J. B. Psychology from the standpoint of a behaviorist. Philadelphia, Lippincott, 1919. 429 p.
12. Wells, F. L. Mental adjustments. N. Y., Appleton, 1917. 331 p.

THE INFLUENCE OF THE GOVERNMENT ON HYGIENE[1]

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Hygiene, the collection of sciences and arts of preserving health, has been a dominant human conception under one name or another ever since that ancient and unknown date when man first sought to defend and protect himself from injury and death. Personal hygiene for the individual, group hygiene for the family, and intergroup hygiene for the community are as old as the individual to whom life has always been precious; as old as the primitive family, the very existence of which grew out of a compelling need for a group defense for the protection of human life; and as old as the community whose prehistoric advent was the inevitable consequence of natural intergroup necessity and was achieved for the mutual preservation of family and individual life.

In fact, the protection and defense of life is the compelling fundamental and elemental reason for government. Governmental concern in hygiene in a narrow and perhaps obscure sense has existed, therefore, from the very beginning of government itself. This responsibility for the preservation of health has been recognized in a slowly enlarging degree from the rude household and community protections against beasts of prey and human enemies; from measures for the conservation and defense of food and water supplies; and from provisions for the preservation of family unity and integrity in primeval human life to the complicated modern governmental provisions for military and naval defense, for commerce and agriculture, and for all modern developments concerned with the maintenance of national unity and integrity.

With the accumulation of modern scientific knowledge, it has become evident that the preservation of health is not merely a defense against natural adverse forces, beasts of prey, and human enemies. The preservation of human life, the conservation of national vitality, the maintenance of national vigor, unity and integrity have become recognized as matters of much broader governmental obligation and responsibility during the last fifty years of the many centuries that have contributed to the formulation of governmental policies and programs.

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The national disasters of infant mortality, the gross and subtle social damages of malnutrition, the enormous community losses from preventable accidents, and from such avoidable and serious diseases as syphilis, gonorrhea, tuberculosis, malaria, and typhoid; the quantative premature human wreckage from diseases of decay; the terrifying mysterious, wholesale devastations made by influenza and cancer, are all samples of enemies that are more dangerous to human life than were the gross natural forces, the beasts of prey, and the human enemies that figure so impressively and so compellingly in the primeval appearance and slow evolution of government.

Our Government with its inheritance from older governments and with its own constructive statesmanship, passing as it has through the relatively primitive conditions that characterized its colonial beginnings in a new, strange, and savage world, has done much for the preservation of the health of its people. We lag behind other countries in some respects, but on the whole our national intergroup hygiene is of an advanced order. Our Federal laws and provisions recognize the seriousness of the subtle as well as the gross quantative social and national damage of avoidable and preventable disease, and poor health, and of avoidable and postponable death. When the crisis of a fearful war arrives and we face the possibility of national destruction with all the cruelties and sufferings that war is known to bring, we develop a program of national intergroup hygiene that makes our Army the healthiest army of all history despite the fearful calamity of influenza, for which we have as yet no preventive or remedial hygiene.

I do not plan to present a résumé of what our Government has done for the preservation of the health of its people, nor will I attempt to give a complete estimate of what the Government is now doing. But one is tempted to stress at every opportunity, the epochal scientific contributions of men working under the Government, such as, Theobal Smith, and Reed, Carroll, Lazear, and Agramonte. One prefers not to pass unnoted in a presentation like this, the governmental demonstrations of the control of typhoid fever, of syphilis, of gonorrhea, and of small pox; or its successful protection of our people against cholera, yellow fever, malaria, and bubonic plague.

The fact that I can not outline here the work of the Bureau of Education along lines of School Hygiene, or of the Department of Labor along lines of Child Hygiene, does not mean that the Government has not had a powerful influence upon hygiene through those agencies. And the same may be said of other governmental agencies such as certain divisions of the

Treasury Department, the Department of Agriculture, the War Department and the Navy Department.

And a very real story can be told concerning the remarkable programs of hygiene carried on by the General Medical Board of the National Council of Defense, by the Army and the Navy and by the Commissions on Training Camp Activities during the war, and by the United States Public Health Service during the latter part of the war and since the war. Much might well be said of the programs of intergroup hygiene for the prevention, treatment and control of venereal disease, developed by the Government in forty-eight State Departments of Health during the last three years through the United States Interdepartmental Social Hygiene Board and through the Division of Venereal Diseases of the United States Public Health Service, reaching, treating, and instructing hundreds of thousands of men, women and children.

And it is hard not to give here, in detail, an outline of the promising researches in the prevention and treatment of venereal diseases that are being carried out in twenty-three of our best scientific laboratories under grants made by Congress through the United States Interdepartmental Social Hygiene Board. A single one of the forty-three researches supported by the Board may yield results of tremendous and far reaching significance. At present, a single case of syphilis requires a minimum of two years for cure. The cost in money is easily a thousand dollars per case and may be ten times that amount. The cost in time lost, in transportation expense, and in reduced productivity is very great and very hard to estimate. The results of a single research may reduce the cost of this treatment, or reduce the time of treatment, or increase the effectiveness of treatment, or save a part of the gruesome sequelæ whose damages are recorded in terms of sterility, abortion, miscarriage, dead babies, damaged mentality, crippled nerves, heart disease, and apoplexy. Furthermore, every scientific truth gained through these researches becomes the common property and the perpetual possession of all the people, and a permanent addition to the general defense of the common welfare.

And I wish I might discuss here, in some detail, the program of social measures developed by the Government through the Commissions on Training Camp Activities and later, through the United States Interdepartmental Social Hygiene Board, for the protection of soldiers and sailors and civilians, against the carriers of venereal disease.

The Commissions and the United States Interdepartmental Social Hygiene Board have demonstrated that protective social measures (including law enforcement) are essential to the suppression of gross prostitution and to the prevention of the dissemination of gonorrhea, syphilis, and chancroid through prostitution.

During the period of activity of the Commissions on Training Camp Activities and of the Board, over twenty-two thousand delinquent women and girls were covered by this program of protective measures. In the calendar years 1920 and 1921—seventy-five red light districts were closed, and five hundred and eighty-seven houses of prostitution were closed. During the single month of January, 1921, fourteen hundred and one men were arrested and twelve hundred and fifteen convicted because of their relationship to prostitution.

This Governmental experience in protective intergroup hygiene has established the fact that no municipal, county, or state plan for the control of venereal disease or of prostitution can succeed in the absence of a careful program of protective measures including at least all the elements contained in the program developed by the Commissions on Training Camp Activities and the United States Interdepartmental Social Hygiene Board.

Furthermore, this program, or one like it, is obviously essential to the best success of any community plan for the protection and defense against other social diseases, such as, tuberculosis, or hook worm.

But in addition to all these activities carried on under the Government, there has been developed within the last three years, another program which gives the very greatest promise of future influence upon the standards of hygiene in America.

The most effective influence and the influence that will eventually go farthest toward the acquisition and preservation of national health, will come out of the program of educational hygiene proposed and extended by the Government through the United States Interdepartmental Social Hygiene Board in 1919, 1920, and 1921.

This program of educational hygiene was advanced by the Board for the purpose of establishing or enlarging Departments of Hygiene in normal schools, colleges and universities that would enable the educational institution concerned to place before its student body the best presentation of the sciences and the arts of preserving the health, making certain that this presentation would not discriminate against the hygiene of the venereal diseases, gonorrhea, syphilis and chancroid. The departmental program proposed was to be a whole program with no discriminations.

In entering into these agreements with normal schools, colleges, and universities, the Board was particularly careful to respect with absolute fidelity the local educational independence of each institution. A departmental organization was proposed but details of its educational content were made the obligation and responsibility of the institution that joined the Government in a realization of its plans.

Under this program of the Government, forty normal schools, colleges and universities agreed to organize and establish departments of hygiene for the instruction and training of all students, men and women, who may enter therein in any of their departments and especially of those who enter for the purpose of preparing themselves as teachers. These normal schools, colleges and universities agreed that their instruction and training in hygiene would conform in the general plan and requirements with the organization suggested by the U. S. Interdepartmental Social Hygiene Board; and each of these institutions of higher learning agreed to make every reasonable effort to secure and maintain a fine quality and a high standard of instructional service in its department of hygiene; and each institution pledged itself to make every reasonable effort to maintain its department of hygiene as a permanent part of its organization.

The program of the Board proposed for each institution an integrated organization of all its hygiene factors and resources, respecting always, however, the administrative traditions and administrative problems of the institution itself. The Board expected each institution receiving aid to bring about an equal efficiency of all the factors in its departmental program and to achieve as completely and rapidly as possible the benefits of this unified organization in accordance with its own traditions and its own special conditions.

The departmental divisions proposed by the Government were:—

First: A division of informational hygiene which included (a) a presentation of the principles of general hygiene, individual hygiene, group hygiene and intergroup hygiene; (b) a presentation of the principles of physical training; and (c) the informational findings of carefully conducted health examinations.

The second departmental division proposed was called the division of applied hygiene. This division included (a) health conferences and (b) physical training and all its subdivisions, such as gymnastics, aquatics, sports, games and athletics. Institutions having provisions for remedial and corrective hygiene, such as clinical and hospital facilities, would include those activities under the conception of applied hygiene.

The third division proposed was concerned with the accumulation of reliable records of departmental activities and influences. This division was called the Division of Records and Planning.

In accepting this organization, these institutions further agreed to the following standards for the regulation of the selection of departmental personnel:

(1) That the Director should be selected because his scientific training and special experience fit him for supervision, leadership, research and teaching and for administrative responsibility.

(2) That the teachers of hygiene and physical training employed should be selected with special reference to their wholesome influence on students and because of their ability to make successful use of their peculiar opportunities, to emphasize appropriately and with due proportion, proper tact and with persistency, the serious importance of the venereal diseases, their causes, carriers, injuries and preventions, while they emphasize at the same time the other important facts and applications of general, individual, group and intergroup hygiene.

(3) That a co-ordinator will be appointed who will serve to influence every teacher in every department on the entire staff of the institutions to meet his obligations in relation to the individual hygiene of the students in his classes and to the sanitation of the class room in which he meets his students.

With possibly one or two exceptions, every institution that entered into these agreements with the Government has made a real advance in its organization for effective instruction in hygiene. A report covering this work for the year ending June 30, 1920, may be secured by application to the U. S. Interdepartmental Social Hygiene Board, Washington, D. C. The report for the year ending June 30, 1921, is now in press.

With the withdrawal of governmental support, there has come an increase in institutional support, and in some cases the added institutional support has exceeded the governmental support that has been withdrawn.

In practically every case the financial resource supplied by the institution has been increased during the period of governmental help. The total investment made by these institutions has exceeded their original investments by more than 50%.

The influence of the Government through this educational program has reached forty institutions of higher learning, as stated above. The departments of hygiene organized or enlarged in these institutions have stimulated other normal schools, colleges, and universities to improve and extend their own departmental organizations.

Fifty thousand college men and women are being reached by these departments this year. The ever continuing flow of young men and young women through these departments will supply the general public with an endless and growing stream of more completely informed citizens whose standards of hygiene will become the standards of the nation.

Harvard, Cornell, the State Teachers College in Albany, N. Y., the University of Utah, Nevada and Oregon, and each and every one of these institutions influenced in this program has a never ending future. Oxford, Cambridge and Paris have centuries of history behind them. Who will say there is not even more history ahead of them and of us? And who will say that the demonstrated utilities of these forty departments will not stimulate a like beginning and a like progress in ten times that number as the hands of time move on?

The college man and the college woman are influential factors in the state and the nation. They establish standards of home hygiene. They become the teachers of teachers and the moulders and fashioners of educational hygiene in the schools of the land. They are the source of support for wise policies of public health in the municipality and in the commonwealth. The college graduate of tomorrow will give and demand a better public hygiene and he will give and demand a better standard of private hygiene. The public health official and the physician in private practice will have a supporter—and a critic!

Viewed as final achievements, the results of the last three years are far from satisfactory. There is not a single institution that has perfected its departmental organization or its instructional program in hygiene.

But as a record of progress toward an ideal, these three years are full of satisfying promise. No two of these institutions are alike in their departmental development but every one of them has made a step toward permanent improvement in one or more phases of organization for instruction in the principles and practices of hygiene.

In summary it may be stated that through this program, the U. S. Government has proposed a plan for the organization of complete departments of hygiene in higher institutions and that this plan makes use of all existing factors of hygiene within the institutions concerned. The plan does not so much contemplate the organization of new departments as it does a reorganization, combination, and utilization of existing facilities and resources. The Government makes no attempt to dominate or direct local policies and it depends upon the instructional resource and intelligence of the individual institution for the detailed organization of the department and for the selection, preparation and method of presentation of curriculum content.

For the benefit of these departments and in the interest of better instruction, the Government has put out a syllabus for the use of teachers of hygiene. This syllabus organizes the subject matter of hygiene into a systematic and orderly sequence covering the whole field and preparing a place for whatever additions the science of the future may make to our store of knowledge in hygiene.

And so the United States Government has added a relatively new defense for the protection of its communities, its homes and its people. It is encouraging physical training and other constructive hygiene measures for the making of vigorous men and women. It is stimulating defensive and remedial hygiene for the conservation of human life, and it is producing a discriminating public intelligence that ultimately will demand a high standard of public health protection and private health practice.

BOOK NOTES

Drake and the Adventurer's Cup. By Isabel Hornibrook. Bost., Little, Brown, 1922. 309 p.

In this story the author has written a thrilling tale with an extraordinarily vivid setting, a tale which trails a lively trio of Academy seniors, migrated South with the birds—for their winter term at Mosquito Inlet, Florida East Coast—into the very heart of the Big Cypress.

The Adventurers' Cup, a silver cup offered to the senior who could tell on Commencement Day the best story of Life, humorous, thrilling, or pathetic, in which he himself has figured, is the prize each senior ardently hopes to win; wherefore this Easter expedition into the heart of the Big Cypress in search of adventure worthy of the silver cup. Within the swamp every advance is hotly disputed by some denizen of the jungle—deadly "Cotton Mouth," bull-aligator, she-bear, panther, outlaw plume hunters. But it is to Drake, true scout and adventurer, that the coveted cup is finally awarded, because in his adventure he has served Life, with insight and with pluck, by capturing in his lonely lair at the heart of the Big Cypress, the "loco" nature wizard and uniting to him the nature-loving "Waif of the Curious Curves," his long-lost orphan grandson.

Every boy scout will want to read and own this book by Isabel Hornibrook, not only because of the excitement it affords for the moment but also because of its permanent value in the strengthening of his scout ideals of loyalty to all that is best in life, and in the accumulation of scientifically accurate nature lore in which this book is extraordinarily rich, the author having herself spent a winter in Florida and consulted the field notes of a resident ornithologist in order that her stage setting might be a truthful portrayal of that marvelous sub-tropical fairyland, Florida.

Frederica F. Kraus.

Elements of Scientific Psychology. By Knight Dunlap. St. Louis, C. V. Mosby Co., 1922. 368 p.

This book by one of the leaders of American psychology is too important to be reviewed in these brief notes. "Psychology is today a science of the conscious responses of the organism and as such is called upon to furnish materials applicable to the problems of physical science, education, industry and the arts, and to social problems." Only the modern form of psychology can contribute to these effectively. "No one thinks today of asking aid in any problem of real life from the psychology, however named, which deals with the peculiar world of psychic objects, by the introspective method, or by any of its later substitutes." This book deals only with the general problems and leaves applications to other textbooks.

Introductory Psychology for Teachers. By E. K. Strong, Jr. Baltimore, Warwick and York, 1922. 255 p.

This is the third edition of a book that appeared in 1919 without much change. The two books treat, the first of thirty topics beginning with what is psychology, and the second with twenty-eight other topics. The aim of this course is radically different from that of preceding ones. The student is immediately introduced to the problem of behavior as a whole, and when he is a little at home in this he is given a psychological background. The scope of the book is broad, including both theory and practice, the style lucid; there is a good index, and a few curves, tables, and illustrations.

The Organization and Administration of Physical Education. By JESSE F. WILLIAMS. N. Y:, Macmillan, 1922. 325 p.

The development of physical education in this country has been desultory; but there is a different temper today, and a great variety of work is offered. This book hopes to set standards, help state facts, suggest tests and guides, etc. After a general chapter and another on guiding principles in organization and administration, the work proceeds to discuss objects, contents, and material activities of gymnasia and playgrounds; organization of a department of physical education; teachers and supervisors; judging the work, administration, athletics, sports, games, contests, credits, attendance, roll taking, determination of the health of schools and efficacy, etc.

The Psychology of Singing. By DAVID C. TAYLOR. N. Y., Macmillan, 1922. 373 p.

There is a real gap between the accepted theoretical basis of instruction in singing and the actual methods of vocal teachers, and it is this that this book attempts to fill and to reduce theories to a satisfactory science of voice culture. Part I deals with modern methods of instruction in six chapters, Part II gives a critical analysis of them in five chapters, III is on the basis of a real science of voice in six chapters, and IV on vocal science and practical voice culture in nine chapters.

The Reading Process. By WILLIAM A. SMITH. N. Y., Macmillan, 1922. 267 p.

This book is not primarily a treatise on the methods of teaching reading but on the principles that underlie the method. It seeks to furnish a body of information psychological, philosophical, historical, and experimental which will enable the teacher to develop and use methods intelligently in place of accepting them blindly. Special attention is given to language, written and spoken; spelling; teaching beginners to read; analysis of the process; silent reading, content, and tests of measuring reading ability.

Acquiring Skill in Teaching. By JAMES R. GRANT. Boston, Silver, Burdett, 1922. 222 p.

The purpose of this book is to guide the reading, thinking, and practice of student teachers and teachers in service, each chapter being preceded by a number of short pedagogical statements.

The first chapter is general, on the teacher, the school, and the community; the second, principles of education and administration; then follow chapters on the technique of teaching, school hygiene, and human nature.

The Output of Professional Schools for Teachers. By CHARLES E. BENSON. Baltimore, Warwick and York, 1922. 88 p.

After a statement of the problem and source, Part II discusses results in (a) types of schools served, (b) the specific administrative, supervisory, and teaching positions filled by the graduates, (c) their distribution according to the curricula completed, length of service, etc., while Part III is devoted to interpretations, conclusions, and suggestions. The themes are illustrated by various charts and tables.

High Schools and Sex Education. Ed. by Benjamin C. Gruenberg. Washington, Govt. Printing Office, 1922. 98 p.

In Part I are treated general aspects, including sex education in the high school, methods and supplementary devices, teacher preparation and co-operation. Part II discusses the subject in connection with other topics—biology, general science, physiology, physical education, economics, social studies, English, with an appendix on emergency devices and the outline of a summer-school course. The Introduction considers the subject in general.

A List of American Doctoral Dissertations Printed in 1920. Prepared by Mary W. MacNair. Washington, Govt. Printing Office, 1922. 179 p.

Supplementary lists were printed in 1912, 1916, 1918, and 1919. In many cases a few lines are given to indicate the drift of the various theses.

Textbook Selection. By R. H. Franzen and F. B. Knight. Baltimore, Warwick and York, 1922. 94 p.

This work treats of the criteria for the selection of textbooks. Chapter 2 applies the condition of interest to high-school English literature texts, Chapter 3 to elementary geography. It would seem that this method should be extended to textbooks in other subjects.

The Modern Idea of the State. By H. Krabbe. Tr. by George H. Sabine. N. Y., Appleton, 1922. 281 p.

This remarkable work, with eighty-odd pages of introduction by the translator, describes the new conception of the state which is taking the place of the old idea of sovereignty which prevailed under monarchy. To the author the state is essentially a legal community or a law-creating personality subject to its own law, which expresses its collective interests, and nothing more.

Why Wars Come. By Rear Admiral A. P. Niblack. Boston, Stratford Co., 1922. 165 p.

This book is a serious attempt to analyze some of the most important causes of war with a view to avoiding the dangers which lurk in policies which are not altruistic and are not based on the Golden Rule. It is an interesting, well-printed, and timely little volume.

The Validity of American Ideals. By Shailer Mathews. N. Y., Abingdon Press, 1922. 207 p.

The ideals are individuality, democracy, the written constitution, and co-operative sovereignty. But America itself is the highest of these ideals. The test of an ideal is whether it works well as an hypothesis. The problem of the melting pot is really at the root of all our problems now. To many who have lately come upon our shores this country is the synonym of the Holy Grail. But we are doing very little to inculcate anything more than an acquaintance with our language and with some bread-winning art. We must teach all to (1) recognize social responsibilities as the correlate of liberty; (2) law must be respected, although at the same time it is subject to change; (3) the agents of public opinion must be freed; (4) respect for personality must be seen to be the final goal of life; (5) public education must be in the hands of those who believe in Americanism; (6) while all members of a society cannot rank high on any scale, certain moral qualities must be maintained; (7) present imperfections must suggest betterment.

America has advanced hitherto by means of instinct and feeling rather than in response to hereditary leadership. If this mass movement is not intelligent and moral we are lost. We all outgrow Greenwich village.

Constitutional Government in China. By W. W. Willoughby. Washington, Publ. by Carnegie Endowment for International Peace, 1922. 61 p.

This booklet discusses present conditions and prospects, government since 1912, outline of events since 1911, the preparedness of the Chinese for republican government, and finally the present outlook, ending with the outline of the Consistorium.

Russia Today and Tomorrow. By Paul Miliukov. N. Y., Macmillan, 1922. 302 p.

This is a reprint of the author's Lowell Lectures given in the fall of 1921, with material additions. It shows the inevitableness and the long prehistory of the Revolution, why the bolsheviks got the upper hand, their régime, relation to the nationalities, foreign policy, anti-bolshevik Russia, the decline of the movement, the famine, Russia's contribution to the world civilization, the best chapter perhaps being "Russia Tomorrow." While severely criticizing the bolshevik movement, the author believes it is a *fait accompli*, has come to stay, and that this fact should be recognized and the efforts of practical men bent to broadening its policy, which must be done before there can be any substantial affiliation between it and the peasants, whose interests will forever be dominant in that country.

The Vitamins. By H. C. Sherman and S. L. Smith. N. Y., Chemical Catalog Co., 1922. 273 p.

It is often a reproach that the ultimate elements in the three vitamins cannot be analyzed so that we have no chemical formula of them. But this is true also of various toxin and other elements, the utility of which no one longer challenges. The authors hope in this book to stimulate quantitative research as distinguished from merely qualitative tests which have now largely served their purpose. There is a copious bibliography down to the end of 1921. After an historical sketch there is a special chapter devoted to the anti-scorbutic vitamin B; then follows one upon the same action of vitamin C. Chapter 4 discusses the fat-soluble vitamin A; and the fifth chapter, with which the reader is advised to begin, deals with vitamins and the problem of food supply, summarizing the nutritive requirements and the group of food material according to nutritional characteristics, giving also the relative richness of different foods in each of the vitamins and the place of each type of food in the diet.

The General Problems of Psychology. By Robert MacDougall. New York University Press, 1922. 456 p.

This book, without a single diagram or a preface, and without the best kind of get-up, does not seem very attractive to the beginner in this subject, while the very general approach and standpoint of the author are not such as are calculated to stimulate great initial interest. The introductory chapter deals with the general problems of science, the next with the general task of intelligence. Then follow chapters on the abstractions of reflection, the approach to empirical truth, psychology and the system of knowledge, the self of intuition, the arts of life; the field of psychology, its limits, methods, data, and problems.

Texas the Marvellous. By N. O. WINTER. Bost., The Page Co., 1916. 343 p.

This elegant and expensive book gives us a comprehensive picture of the state with its history from the first Spanish settlement and the establishment of the Indian missions to the present time, with an account of those who have contributed most to the upbuilding of the state from LaSalle to Sam Houston. The type and paper are the best, and there are very many full-page illustrations, some of them colored.

Australasia, 1668-1911. By A. W. TILBY. Vol. 5 of *The English People Overseas* series. Lond., Constable and Co., 1912. 446 p.

This volume deals with the invasion of the Antipodes, the pacification of Australasia, the birth of the Australasian nation, the Pacific Ocean and the dominion of New Zealand. It deals also with the foundations of new English settlements by the old British stock. The author found great difficulty in old newspaper files and mildewed forgotten pamphlets and records of travelers. The work, however, although chiefly devoted to administrative aspects, contains much anthropological material of great interest.

Peru. By E. C. VIVIAN. South American Handbook series. N. Y., Appleton, 1921. 235 p.

It was an admirable and timely plan to project this series, and the volumes that have so far appeared in it are well calculated to give the rapidly increasing number of business men, scholars, and statesmen a better knowledge of Latin America than was accessible here before. Maps and illustrations add materially to its value.

A Sketch of Chinese History. By F. L. HAWKS-POTT. Shanghai, Kelly and Walsh, 1915. 215 p.

This is a most interesting epitome of Chinese history from 1122 B. C. on, the main divisions being the conquest of China by the Chinese, the first struggle with the Tartars, and finally the struggle between the Chinese and the Western European nations from A. D. 1662 to the present time. Five interesting maps elucidate the story, which comes down to the establishment of a parliament and which sets forth the chief problems now facing the country, viz., an ignorant electorate, national credit, the harmony between the provinces and central government, the avoidance of overpopulation, how to harmonize the new and the old, and how to leaven the country with religious and moral principles that will keep it from falling into the slough of materialism. The great misfortune of the republic is that it came to power just at the time when China was shrinking and threatened with loss of control in both Manchuria and Tibet.

The Evolution of Modern Medicine. By SIR WILLIAM OSLER. A series of six lectures at Yale, 1913. 213 p.

These lectures, very copiously illustrated with portraits, diagrams, title pages of old books, etc., were ready for publication directly after their delivery, but the war and the inability of the author to revise, and his final death, have caused this delay.

The author has read deeply in Greek and medieval medicine and tells in a very attractive way the story of the Renaissance and of the rise of anatomy and physiology and modern medicine, with a final chapter on preventive medicine. The whole theme is not only one of the most fascinating for both scientists and humanitarians but is one of the very best types of culture history.

The Theatre of Tomorrow. By KENNETH MACGOWAN. N. Y., Boni and Liveright, 1922. 302 p.

The first part treats of The New Stagecraft, with chapters on the twentieth century theater, the mechanician, electrician, painter, the plastic and the formal stage, the actor reanimated, etc. Part II, The New Playhouse, treats of the eternal theater, the movie, and the new theater. Part III, The New Play, discusses the theater without plays, the twilight of realism, the forum of the future, the content of the future, the drama of intimacy and of crowds, the theater of democracy.

Hawaii Past and Present. By W. R. CASTLE, JR. N. Y., Dodd, Mead, 1921. 260 p.

The author's design is first to tell those who stay at home something about the youngest of American territories and second to help those who are going there to plan their trip intelligently. He does not confine himself to any special phase of the subject but touches upon the people, the history, the army and navy in Hawaii, Honolulu and other towns, the volcanoes, and island life. The book has a number of interesting photographic illustrations.

The New Latin America. By J. WARSHAW. N. Y., Crowell, 1922. 415 p.

The author attempts here to give a general and comprehensive picture of Latin America. His chapter headings are fallacies, fancies, and facts; the end of isolation; changing industries; manufactures and labor; paramount foreign interests; the Monroe Doctrine; international rapprochement; the growth of nationalism; social development; public entertainments and education; cultural development; position of women; as Latin Americans see us.

The New Heavens. By GEORGE ELLERY HALE. N. Y., Scribner, 1922. 88 p.

These three articles are designed to give the layman some more or less definite ideas of the methods, instruments, and results of the study of modern astronomic research. It describes the millions of new stars which become visible with every increase in the power of the telescope, the stages of stellar evolution from the thinnest cosmic gas to dead suns whose light goes out in darkness, and gives rather an intelligent account of the new interference method of Michaelson which made it possible to determine within ever narrowing limits the diameter of stars, light from which takes many hundred thousands of years to reach us.

Some Qualities Associated with Success in the Christian Ministry. By MARY E. MOXCEY, Ph. D. N. Y., Columbia University Contributions to Education No. 122. 1922. 101 p.

Geology and astronomy, which are at the base of all views of the universe, should have some place in the training of ministers. Religion should give fullness of life, and we should know what life is; it is to save souls, and we should know what souls are. Modern languages are generally placed low in esteem, but it is a question whether it will not be more worth while for pastors to know these than the ancient languages. Social forces must, of course, be understood, and the minister should understand and be able to handle ideas as well as practical matters.

An Introduction to the History of History. By James T. Shotwell. In Sources and Studies series of "Records of Civilization." N. Y., Columbia U. Press, 1922. 320 p.

Starting with myth, books, writing, etc., we have a section of five chapters devoted to Jewish history, the Pentateuch, formation of the Canon, etc., another five chapters to Greek history, Homer, Herodotus, Thucydides, Polybeus and later historians; to Roman history, Varro, Caesar, Cicero, Livy, Tacitus; Section 5 to Christianity and history, with a postscript on medieval and modern history and methods of interpretation.

American Indian Life. Ed. by Elsie Clews Parsons. N. Y., 1922. 419 p.

This imposing quarto is composed of treatises by a score or two of experts whose work is divided as follows: 4 write on the plain tribes, 3 those of the middle West, 4 on the Eastern, 6 on the South-West, 4 on the Mexican, 3 on the Pacific, and 2 on the northern Athabascan tribes, with a final article on the Eskimo winter by Franz Boas. Nothing we know gives a more human aspect to or better summarizes the very many studies of Indian life that have been made in this country in the last half century. It is a valuable volume.

The New German Constitution. By Rene Brunet. N. Y., 1922. 339 p.

Some Problems of Reconstruction. By Annie M. MacLean, Ph. D. Chicago, McClurg, 1921. 150 p.

Problems in Pan-Americanism. By Samuel Guy Inman. N. Y., Doran, 1922. 415 p.

Silent Reading: A study of the various types. By Charles H. Judd and Guy T. Buswell. U. of Chicago Press, 1922. 160 p.

Studies in Observational Learning. By W. F. Book, Alice S. Beard, and O. R. Chambers. Repr., Bulletin of the Extension Division, Indiana U., August, 1922. 132 p.

Mood in Religion to Performance. By Elizabeth T. Sullivan. Archives of Psychology, No. 53. N. Y., May, 1922. 71 p.

The Influence of Incentive and Punishment upon Reaction-Time. By Albert M. Johanson. Archives of Psychology, No. 54. N. Y., May, 1922. 53 p.

Some Well-Known Mental Tests Evaluated and Compared. By Dorothy R. Morgenthau. Archives of Psychology, No. 52. N. Y., May, 1922. 51 p.

The Return of Arthur. By Irvine Graff. Boston, The Stratford Co., 1922. 19 p.

John Bascom, Prophet. By Sanford Robinson. N. Y., Putnam, 1922. 53 p.

Michelet's Jeanne d'Arc. Ed. by Philip W. Harry. Boston, Stratford, 1922. 212 p.

Malnutrition and School Feeding. By John C. Gebhart. Wash., Govt. Printing Office, 1922. Bull. 37. 39 p.

Die Münchener Eignungsprüfung für Buchdrucker und Schriftsetzer. By Albert Huth. Leipzig, Barth, 1922. 28 p.

Vergleichend-psychologische Untersuchungen über Kindliche Definitionsleistungen. By Hans P. Roloff. Leipzig, Barth, 1922. 168 p.

Annual Report of the Commissioner of Mental Diseases, Massachusetts. Boston, Wright and Potter, 1922. 264 p.

Proceedings of the Society for Psychical Research. Glasgow, Maclehose and Co., 1922. 438 p.

A Life Unveiled. By A Child of the Drumlins. N. Y., Doubleday, Page, 1922. 335 p.

John Burroughs, in his introduction to this book, well characterizes it as the natural history of an American girl in the last quarter of the nineteenth century. Herein we see pictured a typical and representative condition in individuals which contributed to the development of a dreamy, aspiring girl into a woman of serious purpose and substantial achievement in a strenuous and useful career. It seems to be a spontaneous unveiling of memories with entire absence of literary consciousness.

The Dream Problem. By Ram Narayana. Delhi, India, 1922. 588 p.

This is the second volume, to which it would seem the first is largely introductory. It is based on conversations between the Sage and the Dreamer, apparently illustrative of the Vedanta philosophy. The book does not aim to found a new religion or divert from other lines, but its dictum is "goal is one for all; the paths that lead thereto are many." "We believe in absolute truth reached by the great silence symbolized by sleep," etc. There are various portraits and biographies of great interpreters, Yogi and others, Orientals and Westerners.

The Psychological and Ethical Aspects of Mormon Group Life. By Ephraim E. Ericksen. U. of Chicago Press, 1922. 101 p.

This is a remarkably candid discussion of the present conditions of Mormon life and of its conflicts with surroundings, external, political, social, and religious influences, and also of the internal discords between the various sections of the cult.

Spirit. By E. P. S. H. N. Y., Dutton, 1922. 54 p.

Dr. R. C. Cabot thinks this book embodies "a great deal of important truth" with no serious errors of statement. It attempts to prescribe for a long list of mental worries in our nervous age.

An Introduction to Social Ethics: The Social Conscience in a Democracy. By John M. Mecklin, Ph.D. Harcourt, Brace & Co., 1921. 446 p.

Democracy is not negative or a body of rights to be safeguarded rather than utilized. Evolution shows when a land is dynamic rather than static. It becomes real and achieves a place in history by virtue of what it does rather than what it is; just as an individual's own achievement rather than his heredity determines his own place. There is a self-conscious democracy that grasps its ends and conscientiously tries to realize them; it reserves the right to change its mind or modify its law when the better attainment of these laws makes it necessary. It feels responsible for jeopardizing national integrity by changing its mind, and this is its peculiar virtue. "Law-made" democracy and conscience must pass like childish things which must be put away when we become adults. Democracy is not ultimate, but is a means to an end. It is only one of the many solutions of the basal problems of civilization. It is true not because it reflects an external order, but because of its practical results. The whole body of sentiment must be reorganized and self-conscious.

Education and World Citizenship: An Essay toward a Science of Education. By JAMES C. MAXWELL GARNETT. Cambridge University Press, 1922. 515 p.

This author attempts to interpret the whole psychology of education in neurological terms, and he believes that its end is to bring the individual into *rapport* with the entire cosmos. He advocates a single wide interest and says that "the value of any given expenditure of effort either by teacher or taught or by both, decreases rapidly with the number of separate subjects upon which that effort is expended." "Thus the value of any new subject is in proportion to the square of the time during which the study is continued, inversely proportional to the number of separate subjects into which that branch of knowledge is subdivided."

The Rural Mind and Social Welfare. By ERNEST R. GROVES. Chicago, Ill. 205 p.

This is a capital study of such topics as social contribution of Primitive Agriculture, City Drift, Country Life and Herd Instinct, Instinct of Self-Assertion, The Parental and the Sex Instincts, Fear, Pugnacity, Curiosity, Workmanship, Acquisition, Play, Country Church and the Rural Mind, the Psychology of Rural Organization.

The Social History of the Western World. By HARRY ELMER BARNES. N. Y., D. Appleton & Co., 1921. 126 p.

This syllabus seeks to organize material dealing with the history of western society according to one of the possible lines of attack which may be made by the so-called "new history." Its six parts are: I. Prolegomena to Social History; II. Progress in the Pre-Literary Period; III. The Social History of the Near Orient; IV. Classical Society and Material Culture; V. The Social History of Western Europe During the Middle Ages; VI. The Social History of Modern Times. No American author is more competent or more widely read. Such a manual is most timely, but no even extended review can do justice to it.

Einfuhrung in Die Ethik auf Grundlage der Erfahrung. By DR. G. HEYMANS. Leipzig, 1922. 323 p.

After discussing the problem and method and answering various objections, the author proceeds to treat of the moral judgments in general, their content, object, the psychology of the will, the conditions of the moral judgment, international duty, virtue and merit. In the next part he takes up the criticism of moral judgment, discussing virtues and vices, the ethical wrong way, the hypothesis of general criteria, teleologic criteria, individual and universal hedonism, utilitarianism, the intuitive hypothesis, theories of duty, aesthetic and logical and objective theories. Part 3 discusses the applications to life or ethical practice. The judgment of others, one's own cause, self-education and that of others and finally the self-education in the race.

Die Intelligenz der Kinder und Jugendlichen und die Methoden ihrer Untersuchung. By WILLIAM STERN. Leipzig, 1920. 935 p.

The author first gives an account of the development of intelligence, its idea, conditions, etc. Part II begins with a discussion of methods of investigation, and there are no less than twenty-one chapters on the methods of testing individual functions and six upon the method of proving the accuracy of results. The third part is devoted to the application of results, especially in the school. The social conditions of intelligence are in four sections and the psychological methods of analysis are in four, while eleven sections are devoted to a general survey of tests of writing. This is the best historical account we have. This work really ought to be translated into English. It approaches the subject by methods sufficiently diverse from those we are accustomed to in this country, and its findings and valuations are independent.

The Little Corner Never Conquered: The Story of the American Red Cross War Work for Belgium. By JOHN VAN SCHAICK, JR. N. Y., 1922. 282 p.

This is a story of the American Red Cross war work for Belgium. There are a number of illustrations. The book well sets forth the monumental work of the Red Cross war work. Nowhere was better work done than in Belgium.

The Political Institutions and Theories of the Hindus; A Study in Comparative Politics. By BENOY KUMAR SARKAR. Leipzig, 1922. 242 p.

The learned author starts with a view of comparative politics from Hindu data, their development, the Hindu constitution, its development, property and woman in private law, public law of the Hindus, their machinery of Imperial Nationalism, their Republics. Part II deals with the concepts of Hindu politics, the literature on the subject, theory of the constitution in Hindu political philosophy, property, law and social order and international relations, etc.

The Force of Intercession. By CONRAD H. GOODWIN. Boston. 182 p.

This is a study of the nature and psychology of prayer and answers to it. The importance of the spirit of intercession is that it should be united, that we should think of the solidarity of the race, pray for our enemies and have faith according to reason, etc.

Graded List of Books for Children. Prepared by the Elementary School Library Committee of the National Education Association. Chicago, 1922. 235 p.

This bibliography is by grade from one to nine inclusive. It is followed by a chapter on Reference Books, Out of Print List, Directory of Publishers and Index. It is a descriptive bibliography. Nothing could be more important or more timely than such a publication.

The Call of Education, Vol. I. By J. H. DOYLE. Hammond, Ind. 289 p.

This is Volume I of a promised series, and its sub-title is Biological Integrity. This material seems to be given primarily in form of lectures and discusses the purpose of education, its Genetic Aspects, its Physical Effects, its Relation to Childhood, the Views of Plato, Courage and Cowardice, Introversion, Psychic Re-Education. The purpose concept dominates everything, and its goal is to guarantee biological integrity of individuals. Education must place man far above the popular current standards.

The author's point of view gives this volume a distinctive uplifting character. Even if we cannot agree with the publisher's statement that this is "the book of the century, the first and only book in all history to bring us out of the haze and the maze of the ages," etc., it is a book of rare interest.

La Methode Decroly Amelie Hamaide. Paris. 208 p.

This method has been in operation in Brussels since 1900. A brief account is given of the author, with his portrait and fifty-six illustrations. This method, which is highly indorsed by so high an authority, as Dr. Ed. Claparede attempts to get into closer *rapport* with child nature in primary grades in order to bring the child into touch with life without as well as within school. Perhaps its best results are shown in the creative activity of children's imagination.

Organization for Visual Instruction. By W. H. DUDLEY. Bulletin 1921, No. 7, Department of the Interior Bureau of Education. Washington, D. C. 24 p.

Review of Educational Legislation, 1919 and 1920. By WILLIAM R. HOOD. Bulletin 1922, No. 13, Department of the Interior, Bureau of Education. Washington, D. C. 30 p.

The Mortality of Foreign Race Stocks. By LOUIS I. DUBLIN, PH. D. Reprinted from the *Scientific Monthly*, January, 1922. 103 p.

Preparation of Teachers of the Social Studies for the Secondary Schools. By EDGAR DAWSON, PH. D. Bulletin 1922, No. 3, Department of the Interior, Bureau of Education. Washington, D. C., 1922. 24 p.

The Reorganization of Mathematics in Secondary Education: A Summary of the report by the National Committee on Mathematical Requirements. Bulletin 1921, No. 32, Department of the Interior, Bureau of Education. Washington, D. C., 1922. 73 p.

America and the Rehabilitation of Europe. The Annals, Vol. CII, July, 1922. The American Academy of Political and Social Science. Philadelphia, 1922. 217 p.

The Ethics of the Professions and of Business. Vol. CI, May, 1922, No. 190. Philadelphia, The Annals of the American Academy of Political and Social Science. 315 p.

Supplementary Educational Monographs. The University of Chicago. Chicago, Ill.
No. 18, June, 1922. How Numerals Are Read: An Experimental Study of the Reading of Isolated Numerals and Numerals in Arithmetic Problems. By PAUL WASHINGTON TERRY. 109 p.
No. 19, May, 1922. The Selective Character of American Secondary Education. By GEORGE SYLVESTER COUNTS. 162 p.
No. 20, June, 1922. Curriculum-Making in Los Angeles. By FRANKLIN ROBBITT. 106 p.
No. 21, June, 1922. Fundamental Reading Habits: A Study of Their Development. By GUY THOMAS BUSWELL. 150 p.
No. 22, June, 1922. Remedial Cases in Reading: Their Diagnosis and *Treatment.* By WILLIAM SCOTT GRAY with co-operation of DELIA KIBBE, LAURA LUCAS, LAWRENCE WILLIAM MILLER. 208 p.

The Johns Hopkins University Studies in Education, No. 5. Edited by Edward F. Buchner. *A Measuring Scale for Free-Hand Drawing. Part I. Representation.* By Linus Ward Kline and Gertrude L. Carey.

The Achievement of Subnormal Children in Standardized Educational Tests. By J. E. Wallace Wallin, Ph. D. Miami University Bulletin. Series XX, No. 7, April, 1922.

Das Psychologische Laboratorium der Hamburgischen Universitat. By Prof. William Stern, Director. 1922. 40 p.

University of Iowa Studies in Education: A Comparison Between General and Special Methods Courses in the Teaching of High School Subjects. By Carl Gustave Frederick Franzen. First Series, No. 58, Mar. 1, 1922. 36 p.

Rivista Pedagogica. Anno XV, Fasc. 5-6, Maggio-Giugno, 1922.

Das Kohler-Wertheimer's Gestaltenprinzip und die moderne Tierpsychologie. By Prof. H. Dexler. Prag, 1922. 227 p.

Algunos Aspectos de la Psicologia del Nino. By Honorio F. Delgado with introduction by William A. White. Lima, 1922. 82 p.

The Indiana Survey of Religious Education. By Walter S. Athearn. 39 p.

Die Feststellung der psychischen Berufseignung und die Schule. Von Erich Stern. Leipzig, 1921.

L'Initiation a L'Activite Intellectuelle et Motrice par les Jeux Educatifs. By Dr. Decroly et Mlle. Mongham. Paris, 155 p.

NOTE

At a Congress held in Munich on December 8 to 10 devoted to comparative individual psychology Dr. Alfred Adler discussed the meaning of personality in present-day psychology, individual psychology and the right of punishment, judges for juveniles, individual psychology and philosophy, the rôle of sensuality in the neuroses, Shakespeare's knowledge of mankind, individual psychology and romantic poetry, nervous and cyclothymic inhibitions of breath, Socrates as a forerunner and prototype of individual psychology, and inhibitions in life and in the neuroses, etc.

ERRATUM

"The Evolution of an Infant's Walking," by Garry C. Myers, in the September issue of this journal is a complete study by itself and not a part of "Infants' Inhibitions: A Genetic Study" as the arrangement would seem to indicate.

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